GENERAL SURVEY
NAVAL DENTAL CORPS

WORLD WAR II
1941 - 1945

Carl A. Schlack
Comdr. DC USN

NAVAL MEDICAL RESEARCH INSTITUTE
NATIONAL NAVAL MEDICAL CENTER
BETHESDA 14 MARYLAND

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To: Chief of the Bureau of Medicine and Surgery

Subj: History of Naval Dental Corps in World War II.

Ref: (a) ChBuMed ltr BUMED H:HP of 28 Feb 1946.

1. In accordance with reference (a), a General Survey of the United States Naval Dental Corps in World War II is forwarded herewith.

2. Might this officer express his pleasure in having been of service and hope that the history meets with the Surgeon General's approval.

Carl A. Schlack

CARL A. SCHLACK
Commander, (DC), U.S.Navy

Encl: (HW)
1. Subject history.

A GENERAL SURVEY
OF THE
UNITED STATES NAVAL DENTAL CORPS
IN
WORLD WAR II

By a directive issued by the Surgeon General of the United States Navy on 12 September 1945 (1), all District, Fleet, Force, Base, Area, Marine and Senior Dental Officers were to submit reports on their professional and personal experiences during World War II. These reports were submitted to the Bureau of Medicine and Surgery where they were briefed and important data abstracted.

Based upon information contained in these reports and the objective of such a history, it became apparent that observations might be divided into four major divisions:

1. Administration
2. Education
3. Research
4. Miscellaneous

The first three divisionsmight be subdivided into the following subdivisions:

(1) Organizational
(2) Materiel
(3) Professional
(4) Personnel

In addition to routine treatment of each subdivision, observations, criticisms, comments and recommendations in each might be considered. Under "Miscellaneous", personal experiences of dental officers in combat and other items, which may or may not be related to Dentistry in the Navy, are grouped.

Data as classified above were procured from dental activities distributed as follows: (1) those ashore, (2) those afloat, and (3) amphibious. Installations ashore included:

Operating Bases	Repair Bases
Construction Battalions(CB's)	Supply Depots
District Dental Officers	Naval Hospitals
Naval Dental Schools	Pre-Flight Schools
Naval Air Stations	Naval Training Centers
V-12 Units	Navy Yards

Installations included among those afloat were: Fleet Hospitals, Ships, which types were: Flag, Battleships, Cruisers, Carriers, Hospitals Ships, Transports for wounded, Tank and Repair Ships, Transport Attack, Transports, Cargo Attack, and miscellaneous ships. Navy only was considered in those installations ashore and afloat. The Amphibious Forces were divided into Naval and Marine Forces. In the Naval Forces the (a) base hospitals, and (b) amphibious training centers have been grouped. Marine (a) aviation, (b) bases, (c) training centers, (d) and divisions comprised the Marine Forces.

The Prisoners of War might be considered separately and would include their experiences and observations as miscellaneous in character since they functioned in a manner, and were governed under circumstances, necessitating such consideration.

A detailed dental historical treatment of each type naval installation does not here seem feasible since such would require

preparation in separate book form. Consequently it was considered more appropriate to trace gross dental developments during the war which might be considered characteristic of naval dental activities in most type naval installations. ~~during the war.~~

ADMINISTRATION

The organization of the United States Government, the Navy Department, the Bureau of Medicine and Surgery and the Dental Division immediately prior to commencement of hostilities may be seen in figures 1, 2 and 3. The proposed organization in time of war is found in figure 4.

Personnel.- The total strength of the Navy on 31 December 1941, was approximately 486,225 officers, men and women, including the Marine Corps and Coast Guard (2). Of this number 759 (3) were naval dental officers, of which 369 were Reserves; 164 were afloat and the rest in the continental United States (4).

In November 1942 (5) it was estimated that approximately 7,000 dental officers would be necessary to care for the dental needs of a 3,500,000 man Navy. It was also estimated at this time that about 5,000 dental officers would be required by 30 June 1944, and distributed as follows:

350 ~~305~~ sea duty

150 hospitals

600 continental limits (F)

100 projects (mobile hospitals, etc.)

300 Navy yards

1200 Naval Training Stations

500 Naval Air Stations

250 Naval Reserve Aviation Bases

400 U. S. Marine Corps, shore (Bases, Barracks, etc.)

400 training schools

120 receiving stations

70 section bases

80 naval stations

400 miscellaneous

Total 4920

By March, 1945 the authorized quota for naval dental officers on active duty was 7200 (6) although this number was never reached before the end of hostilities. At the termination of hostilities the size of the Navy, Marine Corps and Coast Guard had swelled to well over four million officers, men and women. By September, 1945, of this number, 7026 were dental officers (6457 Reserves)(4), of whom approximately 4450 were in the continental United States, 1350 on foreign shore duty and 1206 afloat (4). Roughly then, there was a tenfold increase of personnel during the war.

The first evidence of contemplated use of women dentists in the armed forces appeared in a bill proposed 7 June 1943, by Representative John J. Sparkman of Alabama (7). Subsequent approval of

this bill resulted in the commissioning of Sara E. Krout of Chicago, Illinois as a Lieutenant in the Naval Dental Corps Reserve through the WAVES. She reported for active duty at the Great Lakes Naval Training Center, 1 June 1944 (8). In December of 1943 the profession of Dental Hygienist was likewise recognized by the commissioning of Jessie Rathbone as Ensign in the WAVES, U. S. Naval Reserve (9).

The number of dental technicians who were on active duty at the outbreak of World War II was approximately 1,000, authorized by a letter (10) permitting one and a half dental technicians per dental officer. At the surrender of the enemy on 14 August 1945, a recapitulation of enlisted dental technicians on active duty showed (11) 55 dental repairmen, 2,142 dental prosthetic technicians, and 8,153 dental technicians, general. A more detailed analysis was made available 14 November 1945 (11), and, allowing for loses due to separation from the service, the following was shown: Dental prosthetic personnel (DP) 37 USN, 9 WAVES and 929 V6 and USNI, a total of 975; dental repairmen (DRM) 1 USN and 24 V6 and USNI for a total of 25; dental technicians, prosthetic (~~DTP~~ DPT) 56 USN, 12 WAVES, 3 negro and 839 V6 and USNI for a total of 910; dental technicians, general (~~DTG~~ DGT) 1,100 USN, 1,183 WAVES of which 24 were registered dental hygienists, 16 negro and 5,299 V6 and USNI for a total of 7,599. Thus the enlisted strength of the Naval Dental Corps jumped from about 1,000 to 10,350 during the war.

It may be noted that besides the dental technologists, general (~~DTG~~ DGT) and the dental technologists, prosthetic (DPT) who generally received their training in the Navy, a third classification became necessary, the branch of dental prosthetic technician. This was due to the great number of experienced dental prosthetic technicians who were needed in the service and who came from civilian dental laboratories. Since many had years of experience in this work with little if any hospital corps experience, the situation became an awkward one. The Bureau of Naval Personnel, by a directive issued in March, 1944 (12), remedied the situation by establishing the branch of dental prosthetic technician (DP) with pharmacist's ratings in the Dental Corps.

Organization.- The number of dental activities which were in operation on 7 December 1941 ~~were~~ was 347, ranging from the small one-dental-officer offices found at some of the smaller bases, to the largest located at Great Lakes Training Station, with 155 dental officers on duty (13). On 14 August 1945, Great Lakes Training Station (Center) still contained the largest dental activity with 459 dental officers at the peak (13). (The organization of one of the large activities may be seen in figure 38). At this time the number of dental activities in the Navy had increased to 1,554 (13). See figure 5.

A bill (HR 7243) was introduced by Representative Carl Vinson of Georgia on 17 June 1942, and to the Senate (S 2769) by

Senator David I. Walsh of Massachusetts in September, 1942 (14), proposing the creation of Flag rank in the Dental Corps under the Act of 10 June 1926. After appropriate hearings the bill passed both Houses and was signed by President Roosevelt, 18 December 1942 (15). Captain Alexander Gordon Lyle (DC), USN, was nominated to be the first Rear Admiral in the Dental Corps, and the nomination was approved the last week in March, 1943 (16).

On 16 October 1942 the Surgeon General of the Navy requested the Chief of Naval Personnel to establish the office of District Dental Officer (17). Although some of the larger naval districts had a district dental officer, it was found necessary to make dental officers available at each naval district to better coordinate the function of the Dental Corps. The duties of such district dental officers became organized by a later directive (18),

"The Duties of a District Dental Officer are to:

(a) Advise the Commandant, via official channels, on all dental matters within his purview.

(b) Act under delegated authority as follows:

(1) Plan for establishment, maintenance, or reduction of dental facilities in accordance with the Commandant's plans for operation of the District during and after war.

(2) Recommend regarding assignments, transfers, etc., of officer and enlisted dental personnel.

(3) Coordinate dental activities within the district.

(4) Advise local naval authorities relative to local dental matters and be available for consultation.

(5) Represent the Navy's interests in civilian dental organizations in connection with schools, municipal and state agencies, and components of the American Dental Association functioning as war preparedness, research, dental education, Red Cross, Public relations committees, etc.

(6) Have cognizance of and maintain records and information concerning dental matters connected with or related to the Naval Reserve.

(c) Inspect:

(1) Existing dental facilities within the District relative to the efficiency and adequacy of the dental service.

(2) When indicated, any activity, coming under the cognizance of the Commandant, contemplating installation or major expansion of dental facilities, to the extent necessary to determine that appropriateness and practicality of the proposed installation.

(d) Report to the Bureau of Medicine and Surgery, via official channels, the findings of inspections made under (c) above, together with the recommendations, comments, and suggestions

arising therefrom.

(e) Submit by letter to the Bureau of Medicine and Surgery, via official channels, at any time, information, observations, comments, suggestions, and recommendations not covered by other reports and returns, but which may contribute toward improving the standards of professional care rendered personnel of the Navy and Marine Corps.

/s/ ROSS T. McINTIRE
Vice Admiral (MC), USN
Chief of Bureau "

Later a dental section was established in the Headquarters and Service Company of the Medical Battalion of Marine Divisions of the Fleet Marine Force with the senior dental officer acting as Division Dental Officer (19). The Office of Fleet Dental Officer was established in the SEVENTH Fleet on 17 January 1944 (20), and in December, 1944 the Office of Fleet Dental Officer was established on the Staff of CinCPAC -CinCPOA (21). A Force Dental Officer was assigned to the Staff of Commander South Pacific Forces on 1 June 1943 (22). As far as can be determined the first actual Force Dental Officer designated as such in the Navy was the Senior Dental Officer on the USS WASHINGTON which, with other U. S. ships, joined the British Home Fleet in Scapa Flow, Orkney Islands in 1942 (23).

Representative L. Mendel Rivers of South Carolina introduced a bill (HR 4216) on 17 February 1944, proposing the creation of a separate Naval Dental Department (24). As a result of hearings the bill was amended and re-introduced 7 June 1944 by Representative Rivers (25). An identical bill (S 2144) was introduced in the Senate by Senator Charles O. Andrews of Florida (26). This bill failed passage.

Senator David I. Walsh of Massachusetts introduced another bill (S 715) on 8 March 1945 (27). This bill took into consideration previously versed objections and was an attempt to compromise some points of difference (28). After much controversy a bill was approved 28 December 1945 (29) becoming Public Law 284. The text is here enclosed:

"PUBLIC LAW 284 - - 79th CONGRESS"

(CHAPTER 604 - - 1st SESSION)
(S. 715)
AN ACT

"To provide more efficient dental care for the personnel of the United States Navy.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that within six months after the date of enactment of this act the Bureau of Medicine and Surgery shall be reorganized so as to provide for greater integrity of the Dental Service in accordance with the

provisions hereof.

"SECtion 2. The dental functions of such Bureau shall be defined and prescribed by appropriate directives of such Bureau, and by any necessary regulations of the Secretary of the Navy, to the end that the Dental Division of such Bureau shall study, plan, and direct all matters coming within the cognizance of such Division, as hereinafter prescribed, and all matters relating to dentistry shall be referred to the Dental Division.

"SECtion 3. The Dental Division shall (1) establish professional standards and policies for dental practice; (2) conduct inspections and surveys for maintenance of such standards; (3) initiate and recommend action pertaining to complements, appointments, advancement, training assignment, and transfer of dental personnel; and (4) serve as the advisory agency for the Bureau of Medicine and Surgery on all matters relating directly to dentistry. An officer of the Dental Corps of the Navy shall be detailed as the Chief of the Dental Division. Such officer, while so serving, shall have the rank, pay and allowances of a rear admiral.

"SECtion 4. The Secretary of the Navy shall provide by regulations for establishing on ships and on shore stations dental services to be under the senior dental officer who shall be responsible to the commanding officer of such ship or shore station for all professional, technical, and administrative matters in connection therewith: Provided, that this section shall not be construed to impose any administrative requirements which would interfere with

the proper fuhctioning of battle organizations.

"All laws and parts of laws in conflict herewith are hereby repealed, and nothing contained herein shall act to reduce the grade or rank of any person.

"Approved December 28, 1945."

The organization of the Dental Division of the Bureau of Medicine and Surgery, at the beginning of hostilities was small and required relatively little organizing effort. At that time three dental officers were attached with Captain A. Knox as Chief of the Division (figure 3).

With the tenfold increase in the strength of the Corps reorganization was necessary until at the close of hostilities eight dental officers and two hospital corps officers were required. Reorganization was directed by the Surgeon General by a letter dated 8 February 1943 (30), here quoted:

"Subject: Organization and Function of the Dental Division.

" Provision is herewith made for the reorganization of the Dental Division of the Bureau of Medicine and Surgery so that its primary function shall be to secure, administer, and supply professional advice on all matters pertaining to dental practice in the Medical Department of the Navy.

" The plan of organization of the Dental Division, as outlined herein, shall become effective as soon as necessary arrangements as to personnel, space, supplies, equipment, and transfer of

records and files are complete.

" The Dental Division shall have cognizance of professional standards for dental practice in the Medical Department, and shall conduct inspections and surveys for maintenance of such standards. In addition, it shall serve as the advisory agency for the Bureau of Medicine and Surgery on all matters pertaining to dentistry, e.g., advising the Planning Division on matters pertaining to new or expanded facilities (general and prosthetic), advising the Personnel Division on matters pertaining to personnel in the Dental Corps, advising the Brooklyn Supply Depot on matters pertaining to dental equipment and supplies, advising the Administrative Division on matters pertaining to requests for authorization of civilian or naval prosthetic treatment, etc.

" In order to expedite these functions, the Dental Division shall be divided functionally into two essential parts to be known and referred to respectively as the Standards Section and the Inspections Section.

"Standards Section

" The Standards Section shall have cognizance of professional standards for dental practice in the Medical Department, and shall serve as the advisory agency for the Bureau of Medicine and Surgery on all matters pertaining to dentistry.

"Inspection Section

" The Inspection Section shall conduct inspections and surveys

for maintenance of such standards as are established by the Standards Section.

"Present and Proposed Location of Sections

" In order to consolidate functions of certain sections of the Dental Division with Identical or similar functions of other divisions in the Bureau of Medicine and Surgery, the following transfer, as represented in the table below, is herewith authorized.

	Present Location		Proposed Location	
	Dental Division	Dental Division	Planning Division	Personnel Division	Administrative Division
Standards Section	X				
Inspections Section	X				
Personnel Section				X	
Professional Treatment Section (Authorization of Claims)					X
Material (Planning) Section	X				

"General

" There shall henceforth be no changes in organization or function within the Dental Division, without written authorization from the Chief of the Bureau of Medicine and Surgery.

/s/ ROSS T. McINTIRE"

(see figure 6).

Another reorganization occurred in 1944 (31) and divided the Dental Division into a Dental Standard Branch (further subdivided

into the Dental Policy Section and the Dental Liaison Section), and the Dental Personnel Branch (further subdivided into the Dental Appointment Section and the Dental Assignment Section). The office of Inspector of Dental Activities was a separate office. The exact substance of this directive is here quoted since it best describes the functions of each section and with few exceptions functioned throughout the remainder of the war:

"General.- The Dentistry Division shall (a) consult with the Inspector of Dental Activities in order to determine the dentistry needs and problems arising in the field; (b) study, evaluate, advise and make recommendations on the dentistry needs, problems, standards, practices and performances of dental activities in the Medical Department; (c) initiate and recommend action pertaining to complements, appointments, promotions, advancements, training, assignments and transfer of dental personnel; and (d) maintain liaison with such other Bureau of Medicine and Surgery offices or divisions or such other military and civilian agencies as may be required in the presentation of the functions of this Division.

" In order to expedite these functions, the Dentistry Division shall consist of (a) an Office of the Chief of Division, (b) a Dental Standards Branch, and (c) a Dental Personnel Branch.

"Office of the Chief of Division.- The Chief of the Division shall be responsible for the performance of all functions assigned to the Dentistry Division, but shall adopt no major policies, methods, or

procedures without the approval of the Chief of the Bureau of Medicine and Surgery. In order to assist the Chief of the Division in the general administration of the Division, there shall be established the "Office of the Chief of Division" as part of the organization of the Dentistry Division. The office shall consist of the Chief of the Division and such other personnel as may be required to assist the Chief in the general administration of his duties.

"Dental Standards Branch.- The Dental Standards Branch shall perform the functions listed in points (a),(b) and (d) of paragraph 2 of this directive. This branch shall consist of (a) a Dental Policy Section and (b) a Dental Liaison Section.

"The Dental Policy Section.- The Dental Policy Section shall consult with the Inspector of Dental Activities in order to determine the dentistry needs and problems arising in the field, and shall study, evaluate, advise and make recommendations on the dentistry needs, policies, standards, practices, and performances of dental activities in the Medical Department.

"The Dental Liaison Section.- Shall maintain liaison with such other Bureau of Medicine and Surgery offices or divisions or such other military and civilian agencies as may be required in the prosecution of the functions of this Division.

"Dental Personnel Branch.- The Dental Personnel Branch shall perform the functions listed in point (c) of paragraph 2, of this

directive. This Branch shall consist of (a) a Dental Appointment Section, (b), a Dental Assignment Section.

"The Dental Appointment Section.- Shall be responsible for matters relating to appointments to V-12 dental program, the commissioning of dental officers to training of dental personnel, and to disciplinary cases.

"The Dental Assignment Section.- Shall be responsible for matters relating to officer complement for dental facilities, to assignment and transfer of dental officers, and to promotion and advancement of dental personnel.

"Organization Changes.- The functions and the plan of organization described herein require the transfer of all personnel functions relating to the Dental Corps from the Personnel Division to the Dentistry Division as well as the transfer of the inspection functions of the former Dentistry Division to the Inspector of Dental Activities.

" All matters relating directly to dentistry shall henceforth be referred to the Dentistry Division.

/s/ ROSS T. McINTIRE
Vice Admiral (MC), USN
Chief of Bureau."

By another directive dated 18 September 1944 (32) the Office of Inspector of Dental Activities was established at the Bureau of Medicine and Surgery. Finally on 24 May 1945, there was estab-

lished the office of the Assistant for Dentistry in the Bureau of Medicine and Surgery, and further reorganization of dental functions was directed (33). By this directive the Dental Inspection Office came under the Assistant for Dentistry, as did the Dental Personnel Office (which was divided into the Dental Qualifications, Dental Training and Dental Assignment Sections), and the Dental Professional Office, the former Dental Standards Branch (figure 7). Otherwise the duties of each were similar to those quoted in the reorganization of 18 September 1944. Due to the ever alert attention of the Surgeon General to the needs of the Naval Dental Corps, these reorganizations helped immeasurably to better execute the duties of the Dental Corps and to enable finally, the rendition of better dental service to patients.

Several new and revised official dental record forms were constructed during the war to better coordinate dental activities, to distribute dental supplies more equitably, and gain detailed treatment data more readily (34,35,36,37,38,39). Duplicate dental ledgers for dental supplies and equipment were ordered for all stations in order to better establish the rate of use of items per dental officer (40,41).

Professional.- The problems of health standards for eligibility to enter the armed services became a serious one during the war. The results of physical examination of selectees had brought to light the necessity of either changing health standards or running the

risk of exhausting the source of manpower meeting such health requirements. Application of peacetime dental standards in 1941 caused rejection of one out of every five selectees in the Army (42). In that same year of some 340,000 applicants (who were still volunteers) in the Navy, 7.8 per cent were rejected for dental reasons (43). From 1941 on it was rather difficult to determine what rejections were due to dental conditions also, since the discovery of any disqualifying physical ailment immediately precluded further examination. It is conceivable that percentages of patients rejected for dental reasons might be higher than those recorded if further examination were conducted on those patients disqualified for other general conditions (44).

The naval peacetime dental standards for enlistment in the regular Navy were roughly (45), at least 20 serviceable teeth, four opposing molars (two on each side), and four opposing incisors, two on each side of the median line. A badly decayed tooth was not considered a serviceable one, but one which had been suitably restored by artificial means, was considered serviceable. Gingival disorders, abscessed teeth, oral tumors, attachment apparatus disturbances, mal occlusion and wide edentulous spaces in either the maxillary or mandibular dental arches were considered disqualifying. These general standards were particularly enforced in applicants for aviation and submarine duty, and for officers.

The purpose of 20 serviceable teeth, opposing molars and

incisors was to insure adequate chewing ability as well as to reduce cost when considering prosthetic replacements which would have had to be constructed when such function was impaired. Mal occlusion was disqualifying for similar reasons. Many grossly decayed and abscessed teeth or severe disturbance of the attachment apparatus were causes for rejection because of the possible danger of acting as foci of infection. In the case of tumors, benign and malignant, the reason for disqualification was obvious.

Submarine dental standards required, besides freedom from oral infection, strict adherence to numbers of opposing teeth in order to facilitate secure grasping of a mouthpiece attached to a rescue breathing apparatus. Oral infection and large dental cavities were particularly disqualifying because of the circumstances surrounding such duty. The limited quarters aboard submarines precluded ready availability of dental treatment. Since every man's duty is vitally important to the proper functioning of these craft as a whole, any reduction in the efficiency of one man due to some oral or physical disorder, could reduce the relative operating efficiency of such craft.

In aviation the position of the posterior teeth and the number of teeth, freedom from mal occlusion as well as oral infection, were considered important. Certain Equilibrium phenomena occasioned by lack of equal pressure accommodation on either side of the tympanic membrane (46) and dental pain (47) seemed to be

associated with a lessened amount of inter-maxillary distance and carious teeth.

Since so many applicants were found disqualified because they could not meet the peacetime dental standards, pressure for revision of such standards was increased. By a directive from the Bureau of Personnel (48) and U. S. Marine Corps Headquarters (49) dental standards were lowered and became as follows: Eighteen serviceable teeth (instead of 20), two opposing molars (instead of four, with two on either side), not more than four incisors missing which had been satisfactorily replaced. Cuspids and bicuspids were not to be considered as molars. A carious tooth which could be restored by fillings could be considered a serviceable tooth. Applicants were not to be accepted whose mouth condition was a menace to general health or in whom prosthetic or orthodontia treatment was required.

For officers, nurses, condidates for Naval Academy of the Regular Navy, Marine Corps, midshipmen, merchant marine, officers of the Navy and Marine Corps Reserve - officer candidates for V-7(G), V-12, V-12(A) and class 111-d dental standards were not changed throughout the war.

Much effort was expended by civilian dental organizations and practitioners in co-operation with naval activities to rehabilitate personnel prior to entry into the service, or in rendering dental treatment to those rejected for dental reasons (50). However,

civilian dentists were becoming more scarce as the armed forces were requiring the services of more and more of them until finally the whole rehabilitation problem became that of the armed forces.

As the system of induction also became part of the Navy system for procurement of personnel together with the Army, dental requirements were lowered (51) in accordance with mobilization regulations of the Army (52). A resumé of these requirements for various classes of personnel dated 1 July 1943 is here reproduced:

"DENTAL STANDARDS
FOR
COMMISSION ENLISTMENT INDUCTION
USN USNR USMC USMCR
U. S. NAVY

"OFFICERS:

An applicant must have a minimum of twenty vital permanent teeth, including four opposed molars, two of which are directly opposed on each side of the dental arch, and four directly opposed incisors.

In addition to the above, a candidate must present a high standard as to : formation and condition of the teeth, occlusion, condition of the soft tissues, and such restorations and replacements as may be present.

"Explanation of Standards: Paragraph 1461. Manual of the Medical Department.

"Causes for Rejection: Paragraph 1462. Manual of the Medical Department.

"NURSES:

Same as Officers.

"CANDIDATES FOR NAVAL ACADEMY:

Same as for Officers except that the dental structures shall conform to a higher standard with respect to the number of restorations, degree of mal occlusion, and general condition.

At time of acceptance of the candidate he must have received all the required dental treatment including permanent restorations of carious teeth and the removal of deposits.

"Causes for Rejections: Same as for Officers.

"ENLISTED MEN:

An applicant must have eighteen natural servicable teeth with at least two molars in functional occlusion and not more than four incisors missing which have been satisfactorily replaced.

"Causes for Rejection: Same as for Officers, excepting as modified by difference in standards regarding loss of teeth.

"INDUCTEES:

Acceptable:

(a) Individuals who are well nourished, of good musculature, are free from gross dental infections, and have minimum requirement of an edentulous upper jaw and/or an edentulous lower jaw, correc-

ted or correctible by a full denture or dentures.

(b) Malocclusion - When it is evident from the individuals general physical condition that his malocclusion has not seriously interferred with the mastication of the normal diet, provided that the malocclusion has not resulted in secondary pathological changes.

"Causes for Rejection:

(a) Diseases of the jaws and associated structures which are irremediable or not easily remedied, or which are likely to incapacitate the individual for satisfactory performance of military duty.

(b) Extensive loss of oral tissue in an amount that would prevent replacement of missing teeth by a satisfactory denture.

U. S. NAVAL RESERVE

"OFFICERS:

Same as for Officers, U. S. Navy.

"WOMEN OFFICERS:

W-V(S), U. S. Naval Reserve, W-R, U. S. Coast Guard Reserves:

An applicant must have eighteen vital teeth with two

molars opposing on each side of the dental arch and four opposing incisors without wide edentulous spaces.

"Causes for Rejection:

Same as for Officers, U. S. Navy excepting as modified by difference in standards regarding loss of teeth.

"NURSES:

Same as for Nurses, U. S. Navy, excepting that a candidate whose missing teeth are replaced satisfactorily will be considered for waiver if especially desirable.

"OFFICER CANDIDATES:

V-1, V-1(C), V-1(S):

Enlistment in these classes has been discontinued.

V-5 Aviation Cadets:

An Applicant must have eighteen sound vital teeth with at least two molars in functional occlusion and not more than four incisors missing which are satisfactorily replaced.

"Causes for Rejection:

Same as for Officers, U. S. Navy, excepting as modified by difference in standards regarding loss of teeth.

V-7(G) Accredited College Program, General Service: Same as for Officers, U. S. Navy.

V-7(S) Accredited College Program, Special Service: Same as for V-5 Aviation Cadets.

V-12, V-12(A) Navy College Training Program: Same as for Officers, U. S. Navy.

V-12(S) Navy College Program: Includes only former A.S., V-1(S); A.S., V-7(S); Ensign (P); Ensign H-V(P); and Ensign ChC-V(P).

Same as for V-5 Aviation Cadets.

"WOMEN OFFICER CANDIDATES:

V-9 U. S. Naval Reserve, W-9 U. S. Coast Guard Reserve: Same as for WOMEN OFFICERS.

"MIDSHIPMEN MERCHANT MARINE:

Same as for Officers, U. S. Navy.

"ENLISTED MEN:

9-1, O-2; V-2, V-3, V-4, V-11; M-1, and M-2, Enlistments not accepted in these classes.

Fleet Naval Reserve, F-4-C, F-4-D, and F-5: Individual consideration.

V-6 General Service, Specialist Ratings, CB's, and Negroes:

Same as for INDUCTEES, U. S. Navy.

"WOMEN ENLISTED:

V-10, U. S. Naval Reserve, W-10, U. S. Coast Guard Reserve:

An applicant must have sufficient natural teeth or suitable prosthetic replacements to supply satisfactory biting and masticatory function. Natural teeth must be free of disease. Prosthetic replacements of teeth missing at the time of enlistment will not be authorized at government expense.

"U. S. MARINE CORPS

"OFFICERS:

Same as for Officers, U. S. Navy.

"ENLISTED MEN:

Same as for Enlisted Men, U. S. Navy.

"INDUCTEES:

Same as for Inductees, U. S. Navy.

" U. S. MARINE CORPS RESERVE

"OFFICERS:

Same as for Officers, U. S. Navy

"WOMEN OFFICERS:

Same as for Women Officers, U. S. Naval Reserve.

"CANDIDATES CLASS FOR COMMISSION IIId:

Same as for Officers, U. S. Navy

"WOMEN OFFICER CANDIDATES:

Class VI a: Same as for Women Officers, U. S. Naval Reserve.

"ENLISTED MEN:

Class 1 Fleet Marine Corps Reserve:

Individual consideration.

Class 11 Organized Reserve:

All men now on active duty.

Class 111d Enlisted and re-enlisted men for combat duty: Same as for Inductees, U. S. Navy, except that seventeen year old applicants must meet the standards for enlisted men, U. S. Navy.

Class IV Limited Service for Guard Duty:

Same as for Inductees, U. S. Navy, excepting that inability to bite and/or masticate must have been corrected by dentures or bridges.

"WOMEN ENLISTED:

Class V1b:

Same as for Women, Enlisted, U. S. Naval Reserve,

NOTE: Standards in the cases of classes prefixed by the designations S or SS (SV-12(S) USNR, SS 111 (b) USMCR, etc.) are the same as for these classes when not so prefixed."

With a very few exceptions involving mostly the change in the classification of applicants, the above standards were used throughout the remainder of the war.

Thus by Bureau of Medicine and Surgery directive of 29 May 1943 (51), actually no teeth were necessary in inductees and only

severe infection and anomalies ~~irreparable~~ irreparable, were disqualifying. This was the start of a vast rehabilitation program that caused much concern tothe Dental Corps. In October 1943, 97 dental activities were authorized to render prosthetic dental treatment (53) (figures 29,30,31). A 4,000 per cent increase in dental prosthetic treatment over that two years previously resulted by July 1944 (53a)(figures 29,30,31). Authorization for prosthetic dental treatment as previously required by the Bureau was no longer necessary and became the responsibility of the local dental officer (54). Previously such blanket authority was authorized only for personnel on duty at sea and outside the continental limits of the United States (55). Since dental prosthetic replacements were a problem as early as 1940 which stimulated the directive, ruling Fleet Reserve personnel unqualified for active duty who were in need of urgent or extensive dental treatment or prosthetic replacements (56), one may readily imagine the difficult problem confronting the Dental Corps by introduction of such a program.

The rehabilitation program which became necessary was aimed at making all persons, regardless of their dental condition (within extreme limits), dentally fit. It was an extremely difficult assignment for the Dental Corps, particularly in view of the fact that enlisted men were not qualified for transfer beyond the continental limits of the United States if they were in need of prosthetic treatment (57). Later in the course of the war no man was qualified for duty overseas who did not have his "essential dental treatment, oper-

ative and prosthetic", completed. Appropriate signatures of dental officers had to be affixed to such a statement and entered in the health record of the patient (58,59). The primary responsibility rested with the dental clinic at naval training centers and final responsibility at dental clinics at ports of embarkation (58).

In addition to this vast rehabilitation program, personnel of the United Nations eligible for receipt of lend lease aid were eligible to receive dental treatment when they themselves could not supply adequate care (60). Naval dental facilities were also required to care for Army personnel in areas where no Army dental facilities were available (61).

A resumé of general treatment rendered from commencement of hostilities to their cessation is as follows (62,63,64):

29,654,343	restorations (fillings) all kinds		
509,292	dentures -- all types		
27,232	bridges -- all types		
4,229,809	teeth extracted including impactions		
570	mandibular jaw fractures --	1942)	
76	maxillary jaw fractures --	1942)	
2,780	mandibular jaw fractures --	1943)	See Fig. 28 and "Combat Experiences."
316	maxillary jaw fractures --	1943)	
3,304	mandibular jaw fractures --	1945)	
409 ~~641~~	Maxillo facial fractures --	1945)	
641 ~~409~~	maxillary jaw fractures --	1945)	
1,170	ocular prosthesis --	1945 - 1946.	

Other oral treatment procedures involving the hard and soft tissues were also performed ~~,~~ but detailed summaries were not completed at this writing. Detailed summaries for 1942 and 1943 may be found in references 64 and 65.

Materiel.- The problem of supplies and equipment at the beginning of hostilities became acute. Facilities were just not available to care for the great increase of necessary dental treatment. Priorities on metal were strict and much metal is used in the manufacture of dental equipment and supplies. Many of the dental manufacturing concerns were converting some of their factory facilities to the production of fighting equipment and accessories. Thus dental materiel became less readily available.

To illustrate the acute shortage, dental burs (an item most frequently used) that had been used were to be saved, cleaned, dried, oiled, and sent to the U. S. Naval Medical Supply Depot, Brooklyn, N.Y., for resharpening and reissue (~~65~~ 66). By October, 1942, the dental bur supply was even further curtailed so that only certain types, angle and straight handpiece burs could be manufactured (67) and were available in limited quantities (68).

Finally in December, 1942 a directive ordering the conservation of all critical material by the Medical Department was issued (69). The need for conservation of critical materials was extended to include the saving of amalgam scrap, precious metal bench sweepings and polishing residue (70). Due to the curtailment in supplies,

continental U. S. facilities could requisition dental supplies only on a three month minimum, six month maximum basis. This held throughout the war (71).

The outfitting of dental clinics in various advanced bases was standardized according to certain medical components which were designated for certain bases (72). The medical components, in which dental personnel requirements were included, were arranged by dispensaries of 600; 200; 100; 100 mobile and 50 bed capacity. There were also sub-dispensary dental-mobile, sub-dispensary dental - prosthetic laboratory, and sub-dispensary dental - prosthetic laboratory - mobile components. The dental branch of the War Plans Section determined the dental needs of each of these components and arranged standard lists in great detail (73). When certain functional components became necessary with the establishment of certain advanced bases, dental personnel and equipment could then be ordered by merely using a code word corresponding to that particular list of dental needs (73). This became necessary as can be readily seen when comparing the number of dental clinics in operation at the beginning and end of hostilities.

To compensate for the expanded needs that rehabilitation, manpower requirements, curtailment of supplies, etc., incurred, a "shift" system was devised to keep available dental equipment in service longer than eight hours a day, particularly at the larger training centers and Navyyard dispensaries (74). By this system

dental officers in groups worked at different time periods during the day, and in some cases dental equipment was kept in active use 16 hours a day. Regardless of the unpleasantness and questionable results such a system produced, it was all that could be done under the circumstances. Finally an ALNAV in December of 1945 (75) discontinued this system because with separations from the service, the reverse from that of the beginning of the war occurred; namely, more equipment than personnel became available.

The type dental equipment available in ships at the beginning and end of hostilities may be seen in figures 8 - 10. At the close of the war changes in equipment represented improvements in design of instrument cabinets, units and chairs (as instituted by commercial dental houses throughout the country), and standardization. Other improvements and standardization were initiated principally by the Planning Section of the Bureau of Medicine and Surgery (a good resume appears in 76), or senior dental officers who were assigned to the commissioning and fitting out details aboard ships in which they would later serve. (Fortunately naval dental officers were also attached to the Planning Section of the Bureau of Medicine and Surgery and were given much support). Such improvements were directed mostly towards increasing the number of dental offices aboard some of the larger ships, and at the same time conserving as much space as possible. Attention was directed to the design of sterilizing and treatment procedures which would make the dental

offices aboard more readily available to the Medical Department when actual casualties occurred (figures 9-10).

Ashore there was little deviation from those afloat, in design for the individual operating room (figure 11). There was an increase in the number of operating rooms (figures 32,33,34) and the setting up of more prosthetic facilities (53)(figures 30,31) during the course of the war. The arrangement of clinics ashore and afloat generally followed a pattern similar to that shown in figures 12,13 and 33. Naturally more space was available ashore than aboard ship for the individual operating rooms since restriction of space was not as necessary.

The greatest change took place in the dental equipment for the amphibious and mobile forces. Photographs of the types designed by the War Plans Section and senior dental officers attached to such forces, are shown in figures 14-24b-35-37, and represent those used at the beginning and during the war. With the initiation of the V-12 training program for students at the various schools, and the need of dental treatment by small groups of naval personnel in isolated sections, it became necessary to construct self contained mobile dental operating units (77) and later mobile dental prosthetic units (78). In all, construction of nine mobile dental operating units (77) and one mobile prosthetic unit (78) were authorized. (The first mobile unit went into operation in the EIGHTH Naval District, 18 February 1945 (165)). Dental clinic ships were recommended by Commander Service Forces, Pacific Fleet in June, 1945 (167), and the drawing up of plans for four of such ships was authorized in

August, 1945 (168) figure 39, with the cessation of hostilities these plans were abandoned (169).

Personnel

Type Naval Activities with Dental Treatment Facilities(62)

The distribution of dental activities throughout the world may be seen in figure 5. An approximate summary of the type activities at which dental treatment was available and the extremes in dental officer strength of various size activities by August,1945 may be found in the following table:

ASHORE

Type Activity	No.	Dental Officer Complement	Prosthetic Facilities
Operating bases	70	1 - 12	9
Repair bases	4	1 - 29	3
Construction Battalions (Centers)	3	3 - 53	1
Supply depots	15	1 - 4	0
District Dental Officers	12	1 each	0
Naval Hospitals	55	1 - 20	27
Dental schools	3	4 - 23	3
Pre-Flight schools	4	1 - 8	0
Air Stations	128	1 - 42	19
Training Centers	13	65 - 353	13
V-12 Units	31	1 - 2	0
Navy Yards	5	10 - 46	4
Miscellaneous	65	1 - 24	10*

AFLOAT

Type Activity	No.	Dental Officer Complement	Prosthetic Facilities
Fleet Hospitals	9	3 - 8	?
Naval Ships:			
Flag	13	1 each	0
Battleships	23	3 "	0
Carriers	36	1 - 3	2
Cruisers	72	1 - 3	0
Hospital	12	1 - 3	9
Transport	77	1 - 2	0
Transport for Wounded	3	1 each	0
Tank and Repair	89	1 - 5	12
Transport Attack	241	1 - 3	0
Cargo Attack	26	1 each	0
Miscellaneous	17	1 each	0

AMPHIBIOUS FORCES
NAVAL

Base Hospitals	13	1 - 13	?
Amphibious Training Centers	9	1 - 24	4

MARINES

Aviation	13	1 - 16	2
Bases	9		
Training	8	1 -113	6
Divisions	6	33 each	1 each

The above cited officer strength and number of type activities at the various stations and aboard naval vessels, does not imply that this number of dental officers and activities were on duty at the respective stations or in commission, respectively, throughout the war. As more clinics and ships were built the dental officer complement was reduced at many activities. Consequently the number fluctuated, particularly towards the end of hostilities. Since the numbers are for August, 1945 it is possible that in many activities, particularly at the large training centers, there were more dental officers on duty than cited, at one time or another during the war. As military advances were made in the Pacific, some activities were reduced while others were constructed. It was particularly difficult to determine accurately what the dental personnel and equipment status of any unit was at any given time in the forward areas because of their movements.

EDUCATION

The development of the educational phase of the Naval Dental Corps in this war may be divided into that made available for officers, enlisted men and the dental student group at civilian schools.

Immediately prior to November, 1941 dental officers were assigned to civilian educational institutions for post-graduate instruction in oral surgery, prosthodontia and research (79). These courses were generally for a six month period when feasible, or shorter, and included most of the recognized dental schools in

the United States. During the war to the cessation of hostilities, short post-graduate courses in oral surgery were increased and included, in addition to the generally recognized civilian dental schools, the Mayo Clinic (87). Post-graduate refresher courses, particularly in prosthodontia, were also given at the Naval Dental School at this time (88). Later a course in ocular prosthesis was added to the curriculum (165).

Indoctrinational instruction, particularly to newly commissioned dental officers, was made available at the Naval Dental School (80,79)(figure 25). The course was originally designed to be of seven months' duration (81), and to include as many of the newly commissioned dental officers as possible. However, a three month course was found most practical during the war (82,83,84).

Correspondence courses for naval medical and dental officers of the Naval Reserve were initiated and constructed (85) as early as March, 1940 in obedience to an article in BuNav Manual (86).

With the great increase in reserve dental officers on active duty (89) such indoctrinational instruction had to be taken over by all naval training centers (90). Immediately after cessation of hostilities the indoctrinational course at the Naval Dental School was increased to six months (91).

Medical officers in battle areas were encouraged to communicate freely with the Bureau of Medicine and Surgery (164). Dental officers, as a part of the Medical Department, were encouraged to

likewise aid, whenever possible, in furnishing data in order to facilitate increased efficiency of the Dental Department. By dissemination of such information, courses of instruction, made available to officers prior to transfer to battle areas, were kept current, so that practical instruction was assured.

PERSONNEL

On 1 January 1942, as a result of the information contained in the Fleet Medical News, 7 December 1941 (92), on the role dental officers might play as assistants to medical officers, the Surgeon General directed (93) all dental officers to acquaint themselves with the administration of first aid, treatment of burns, shock and hemorrhage, disposal of the dead and other duties to assist the medical officer. Later it also became necessary for dental officers to learn the administration of intravenous anesthesia, plaster cast construction for orthopedic cases, and assistance in debridement of certain war wounds under supervision of a medical officer. This was a great opportunity for naval dental officers in gaining more general knowledge which would be helpful, particularly, those contemplating renewing private practice of dentistry. Such training was made available to all dental officers (especially those going to sea) at naval hospitals, naval training centers, and at the Naval Dental School in Bethesda, Maryland. Aboard ship dental officers assisted the medical officer in teaching first aid to ship's company. In general the Dental Corps may be rightfully proud of their contribution to treating the wounded, and grateful

for the opportunity afforded them through the directive mentioned above.

Under the Selective Service Act of 1940 provision was made to exempt students at the civilian medical and dental schools from the draft (94). Students completing their first year of study could apply for the commission of Ensign, HV(P), in the Naval Dental Corps Reserve and thereby complete their studies (95,96). A revision was made in the Act on 3 March 1943, the essence of which was briefly summarized (97) as follows:

"All freshmen predental students who will complete their work before 1 July 1945 should be granted deferment by their local draft boards, according to a directive issued by the Selective Service System on March 3. Deferments previously were granted only to those who had completed at least the first year of study."

As the war continued and it became evident that sufficient dental officers would not be made available from routine civilian practice, the military forces undertook to initiate a specialized training program, the Navy proposal of which is here quoted (98,99):

"The terms of the Navy program, while stated in terms of medical schools and medical students, presumably apply to dental schools and dental students.

"Medical students who at present hold commissions as Ensign, H-V(P), USNR, have the option of remaining on inactive duty in their present status until completion of their course in medical school

at their own expense, or they may resign their commission and enlist as Apprentice Seamen, U. S. Naval Reserve, and be placed on active duty with pay, uniforms and per diem allowance to defray the cost of their subsistence. The tuition will be paid by the Navy, including the cost of books and the cost of renting microscopes or other equipment necessary in the medical course.

"ENTERING STUDENTS.- Students who are now in medical schools, or those who have been accepted to the next entering classes, who are Ensigns H-V(P), USNR, will continue in these schools. On satisfactory completion of the prescribed course of studies, the students will be commissioned in the Naval Reserve as Lieutenants (junior grade) MC-V(G) on an inactive duty status to complete one year of internship in a civilian hospital. Those students who desire to enter the Medical Corps of the Regular Navy and successfully pass the examination will be assigned to an internship in a naval hospital on active duty.

"If the student fails to maintain satisfactory standards on active duty in the Navy College Training Program he may be assigned to general duty in enlisted status in the rating for which qualified. The pay of Apprentice Seamen on active duty, without dependents, is $50. per month. Certain allowances are made for the dependents of an Apprentice Seaman on active duty contingent on the allotment by the man concerned of a portion of his pay to his dependents. The amounts of the allowances depend on the number and relationship

of the dependents.

"ENSIGNS.- Married Ensigns H-V(P), USNR, are eligible for enrollment and participation in the Navy College Training Program. The maximum age restrictions prescribed for other Apprentice Seamen in the Navy College Training Program are not applicable to former Ensigns H-V(P).

"Former Ensigns H-V(P) who enlist and who are attending medical school on or about 1 July 1943 will be ordered to active duty at the school which they are attending at that time. Navy medical students in the Navy College Training Program will pursue an accelerated course. While on active duty in school, medical students will wear a Midshipman or Cadet type uniform with suitable distinguishing insignia.

"Applications for appointment as Ensigns H-V(P), USNR, from civilian students in medical school, or those students who have been accepted for admission to the next entering class of an approved school, will not be accepted after 1 June 1943. Thereafter qualified students who are in attendance at or who have been accepted by an approved medical school will, on approval by the Bureau of Medicine and Surgery and the Bureau of Naval Personnel, be inducted as Apprentice Seamen, Class SV-12(S), for training in the Navy College Training Program.

"PROFESSIONAL TRAINING.- Pre-medical students assigned to colleges and universities participating in the Navy College Training Program

will be made up mostly from pre-medical students who now hold an enlisted rating in Class V-1 or V-7, USNR. A small percentage of pre-medical students will be taken from the successful applicants who passed the test given on 2 April 1943 in all high schools and colleges in the country. Tests will be given again in November, 1943 and in March, 1944.

"Pre-medical students formerly in Class V-1 and V-7, on active duty in the Navy College Training Program, who are not selected for medical training by the Navy but who are acceptable to an approved medical school, may submit a request to the Bureau of Naval Personnel for discharge. Each such request will be considered on its own merits. If not acceptable to an approved medical school, such men will be considered candidates for other officer candidates' training in which qualified.

"The course of studies for pre-medical students entering the first term on 1 July 1943 will run for five terms of sixteen weeks each. It is proposed to screen pre-medical students after the first year of their studies. The successful students will continue their course until completion; the failures will be allowed to continue the term they are in at the time of failure and then be assigned other training. It is the intention of the Navy Department that Naval trainees, pursuing a pre-medical course and later assigned to medical schools, be acceptable to the schools to which ordered.

"MORE DETAILS.- In a subsequent release, the following details of the Army-Navy program for dental schools were made available:

"At present it is contemplated that training in medicine, dentistry and veterinary medicine will be initiated in all approved schools by July 14. The dates correspond, as far as possible to the beginning of a new term except in schools in which an academic period starts after July 15; in these cases it is asked that the program be initiated at the first of the month.

"Students in these schools who are called to active duty or are inducted through Selective Service will be assigned with the least possible delay to the unit at the school in which currently enrolled. Preprofessional students who have completed their preparatory training and who have been accepted for matriculation are considered as professional students. They will not be required to accomplish their basic training at the expense of their professional training.

"Other preprofessional students, however, with the exception of those in the Enlisted Reserve Corps and those who enter the Enlisted Reserve Corps through induction prior to 30 June 1943, must receive their basic military training program prior to assignment to the Army Specialized Training Program if they are inducted later. Since this three months' interruption of preprofessional training may mean incomplete preparation for the vacancy for which

accepted by an approved school, full advantage in these cases should be taken of eligibility for deferment under Selective Service. If at the completion of their academic preparation they are inducted, either before or after school, they will be assigned to the unit at the school by which accepted.

"The decision of the Navy that all its medical and dental trainees will receive commutation of quarters and rations complicates the situation, as does the fact that Navy trainees will wear double breasted blue sack suits while the student in the Army is clothed in Khaki. No one complains that the Navy will not permit its bachelors to acquire a dependent."

By this it may be seen that not only those already in school would be permitted to continue their education, but others from the ranks could apply for such studies. The schools chosen for the program by the Army and Navy were as follows (100,99):

"California College of Physicians and Surgeons Dental School.
Dental Schools of the University of California and University of Southern California.
Illinois - Dental Schools of Loyola University, North-western University, and University of Illinois.
Indiana - Indiana University Dental School.
Iowa - State University of Iowa Dental School.
Kentuckey - University of Louisville Dental School.
Michigan - Dental Schools of University of Detroit and University of Michigan.

Minnesota - University of Minnesota Dental School.

Missouri - University of Kansas City, St. Louis University and Washington University.

Nebraska - Dental Schools of Creighton University and University of Nebraska.

Ohio - Dental Schools of Ohio State University and Western Reserve University.

Oregon - North Pacific College of Oregon Dental School.

Pennsylvania - Dental Schools of Temple University, University of Pennsylvania and University of Pittsburgh.

Texas - Texas Dental College and Baylor University Dental School.

Wisconsin - Marquette University Dental School."

For the Navy this specialized training program (which included dentistry) became known as the V-12 program and became effective 1 July 1943 (101). By 1 October 1943 (101) the number of naval personnel enrolled in the dental phase of this program was 1,851, distributed as follows: Freshmen 288, sophomores 457, juniors 607, seniors 499. In addition, there were 102 students who retained their commission as Ensign H-V(P) (101). With the initiation of the V-12 program, students with commissions were requested to resign their commissions and enter the training program and thus have their education paid for by the Government. The number of pre-dental students commissioned and enrolled numbered 147 at this time (101). The methods by which the Navy selected dental students, reviewed in the Journal of the American Dental Association, mid-monthly issue of 15 October 1943, is here quoted (102):

"The Bureau of Naval Personnel of the Navy Department has announced that students will be selected for medical or dental training in the V-12 program on the basis of their potential professional ability and on their records through the ends of their third term. Selection will be made as early as practicable in the fourth terms of the applicant's work with the two following exceptions:

"(a) For the first such selection, men who have already advanced beyond their fourth term will be considered on the basis of their work through the lastterm completed.

(b) Former apprentice seamen V-1 and V-7 who were accepted by approved medical schools or accredited dental schools prior to 1 July 1943 will be assigned to the schools which accepted their applications without further review of their credential by the Committee of Deans referred to.

"For both medical and dental students, there is to be a committee in each naval district composed of deans of the medical or dental schools, or their representatives, in the district and the district training officer as a consultant member, which shall be requested to prepare lists of pre-medical and pre-dental students for consideration for medical training. The Bureau of Naval Personnel will assign students from these lists to fill available vacancies

in approved and accredited dental and medical schools throughout the country on the following basis:

"(a) In the case of a nation wide excess of qualified students, the same percentage of qualified students from the top of each list down is to be assigned to medical and dental training from each district.

"(b) All men selected in accordance with the foregoing procedure who complete pre-medical work at the end of a given Naval V-12 term are to enter medical or dental school before men finishing their pre-medical or pre-dental studies at the end of a later term.

"(c) Men selected for medical or dental training are to be assigned to schools in their districts if possible without violating (b). If not possible to assign men to schools in their districts, they will be assigned to schools in the nearest districts that have vacancies.

"(d) Men are to be assigned to the school of their choice if possible without violating (b) or (c)."

Another more detailed resumé which came directly from the Surgeon General's office appeared in the December issue of the Journal of Dental Education (103).

Pre-dental students under instruction in the V-12 program who completed their pre-professional work were assigned to dental departments of naval hospitals for duty pending further assignment to professional schools (104,105).

Modification in eligibility for V-12 training program occurred from time to time in which physical requirements were more definitely stated, and more enlisted personnel, who had previous premedical or predental education, between the ages of 17 and 30 could apply (106). The age limit of such applicants was raised to 31 years in March,1944 (107). In May, 1944 enlisted personnel of the Coast Guard and Marine Corps and their Reserve components also became eligible for medical and dental training under the V-12 program (108).

Immediately after the close of hostilities all further applications for special training courses (medical, dental and chaplain) were cancelled (109). Some dental V-12 training units at civilian colleges were being disestablished (110), one as early as 10 July 1945(111). With the establishment of educational opportunities for personnel separated from the services in the GI Bill of Rights, those who took advantage of the V-12 program were not considered eligible for application (112). This was considered fair to those who had seen active combat during the war or had served on active duty in the armed forces.

It might be interesting to note here that the medical and dental attention which was made available to students in the V-12 program was at first accomplished mainly by contract with civilian dentists practicing close to the institution in which students were assigned (113). In some cases dental officers with portable equip-

ment rendered such treatment (114). Later dental officers were assigned to most universities under contract in the V-12 program (113).

By 10 December 1945, 1,512 had graduated, 193 were freshmen, 413 were sophomores, 514 juniors, and 349 seniors making a total of 1,469 in training; for a grand total of 2,981 enrolled in the dental training section of the Navy's V-12 program (115).

Enlisted personnel in the Hospital Corps, technician branch, prior to 7 November 1941, received instruction for four months at the Naval Dental School for the Dental Technician's, General, course (79,80), and five months for the Dental Technician's, Prosthetic, course, given at all Naval Prosthetic Dental activities (79,80). All ratings were eligible for the "General" course but PhM 1/c, PhM 2/c, and PhM 3/c only were eligible for the "Prosthetic" course (79,80). In November, 1941 these courses were shortened (116) (due to the expanded emergency program) to ten weeks for "General" and four months for the "Prosthetic" courses. Ratings eligible for the "General" course were now PhM 2/c, PhM 3/c, and HA 1/c. For the "Prosthetic" course the same ratings as previously mentioned were eligible (116). Also by this same directive, the Dental Technician, General course was to be given at naval activities as designated instead of at the Naval Dental School only. This facilitated filling of vacancies more rapidly.

With the greatly expanded dental clinics came the operation

of a great amount of dental equipment. Maintenance and repair became a problem to such an extent that enlisted men had to be trained in such work (DRM - Dental Repairmen). The first Dental Maintenance and Repair School in the U. S. Navy was established at the U. S. Naval Training Center, Bainbridge, Maryland, 25 February 1945 (165).

By August, 1943 the need for hospital corpsmen overseas became so acute that WAVES (V-10) were being used whenever possible to take the place of men (117) in the continental U. S. In addition, although training for corpsmen in certain specialties was accomplished at activities so designated (116), by a directive issued in January, 1945, some 102 naval activities were assigned the regular duty of training hospital corpsmen in these specialties (118).

Prerequisites for training towards the certificate of Dental Technologist, General, by January, 1945 were revised (119) to make minimum requirements -- two years high school and recommendation by a dental officer, with desirable qualifications of graduation from a high school and some dental experience. For training towards a certificate in Dental Technologist, Prosthetic, the minimum requirements were two years high school, manual dexterity, mechanical ability and recommendation by a dental officer; the desirable qualifications to include graduation from a high school, dental prosthetic experience, and a certificate as Dental Technologist, General.

The distribution of training among the many naval dental activities, and the accelerated course apparently were successful to the degree that by a directive issued in June, 1945 (120) the time allotted for training Dental Technologists, General and Prosthetic, was restored to that before November, 1941 (116).

MATERIEL

To standardize instruction to all hospital corpsmen a "Catalogue of Hospital Corps Schools and Courses" was compiled (121)(revised in 1944 (122)). The Dental Technologist, General and Prosthetic, courses with appropriate text books (123,124) of instructions as indicated in the catalogue, were organized and written at the Naval Dental School. These books (121,122,123, 124) were used throughout the Navy as a guide as well as a source of material for teaching those taking the course in Dental Technology, General and Prosthetic.

Other educational means employed were audio visual in nature. The Naval Dental School was most interested in this means. By September, 1941, when the first board (to which a dental officer was attached) to investigate the possibilities of use of motion pictures was appointed by the Medical Officer in Command of the Naval Medical Center (125), six full length color motion picture films had been produced, three were in production and three contemplated (~~116~~ 126). Most of these were revised and/or reproduced for dissemination throughout all naval activities and ~~aboard~~ Abroad where dental instruction was given. By November, 1942 (127) three were

chosen and made available for duplication (1) "Duties of a Dental Technician". (2)"Treatment of Jaw Fractures", (3) "Oral Surgery (apicoectomy, two methods)". In the preliminary phase of the dental visual educational program, the Surgeon General of the Navy and Rear Admiral Harold W. Smith (MC), USN (Ret.) were most helpful and encouraging.

Another board was appointed by the Commanding Officer of the National Naval Medical Center, Bethesda, Maryland, to develop motion pictures, in April, 1942 (128). A dental officer was also assigned to this board. The medical audio visual educational program developed to such an extent that by July, 1942, a section of Audio Visual Education had been established in the Division of Preventive Medicine in the Bureau of Medicine and Surgery (129). By January, 1944 a total of eight dental instructional films which had been produced at the Naval Dental School prior to March, 1943 were made available for duplication and distribution to training centers (130). In the Naval Catalogue of the United States Navy Training Films (cumulative supplement), an additional film, which was produced by the Naval Dental Activity in Brooklyn, N.Y., was added (131).

As the war progressed the volume of audio visual educational needs became so great that local naval technicians could not care for them, and civilian organizations were called upon to render the technical assistance required. Medical training films, both still

and moving, sound and silent, were used to such an extent that separate lists in the form of a catalogue became necessary (132) in 1945; 14 Naval Dental Training Films were listed in this catalogue. At present others are contemplated as well as construction of a book in Oral Pathology. Needless to say all such teaching aids, written and visual, were more than welcome at all educational facilities throughout the Navy, and contributed more than any other single effort in standardizing and increasing the efficiency of teaching procedures in the Naval Medical and Dental Corps.

RESEARCH

Organization.- Although research under the cognizance of the Bureau of Medicine and Surgery was supported with the help of the National Research Council as early as 1934 (133), it was not until December, 1939 that the Navy Department decided to coordinate all research activities of the Navy (134). A Naval Research and Development Board was organized in 1941 (135), and in July of that same year Rear Admiral Harold W. Smith (MC), USN, was designated by the Secretary of the Navy to represent the Bureau of Medicine and Surgery as advisor to Doctor Jerome C. Hunsaker, the Coordinator of Naval Research and Development (136). By a letter from the Coordinator of Naval Research and Development to the Bureau of Medicine and Surgery in October, 1941, Rear Admiral Harold W. Smith was designated to establish liaison between Naval Medical Research and the Coordinator of Research and Development (137). Finally, in January, 1942, a Research Division was established in the Bureau of

Medicine and Surgery with Rear Admiral Harold W. Smith as Chief of the Division (138) (figures 7, 26).

Prior to the commencement of hostilities, dental research in the Medical Department was under the cognizance of the Naval Dental School (figure 25) (81,82,83,84). The first dental research project X-44 (later changed to X-131) was approved by the Bureau of Medicine and Surgery on 24 June 1942 (139). It was a large statistical survey and four reports have thus far been published (144,a,b,c,d,e).

On 29 October 1942 the first naval dental officer was officially ordered to the new Naval Medical Research Institute (140) which had been commissioned 27 October 1942. By these orders the first dental facility, for Dental Research alone, was established in the Navy (figure 27). Later in December, 1942, a naval dental officer was designated for the first time by the Research Division of the Bureau of Medicine and Surgery to act as liaison between Naval Dental Research and the Research Division, Bureau of Medicine and Surgery (141).

Dental Research as conducted in the Navy from the beginning of World War II to the present, with few exceptions, is best described in a resumé which appeared in the December issue of the Journal of Dental Education, 1942 (142)(figure 25) here reproduced:

"Three main subdivisions for dental research in the Navy are possible. First, short range programs embracing individual curiosity

with resultant observations and experimentation. These may or may not be related to dental problems and depend solely upon the initiative of the individual. The burden of time, materials, apparatus and support rests upon the investigator alone. Results may or may not be of aid to the Navy.

"The second subdivision is the program as presented at the Naval Dental School. Here newly commissioned dental officers undergoing indoctrinational courses are taught technical composition of reports for publication, methods of choosing problems for investigation, and means of recognizing proper procedure principally aimed at the reduction of variables to a minimum. These courses are valuable means of training the dental officer in Naval Research methods as well as starting him upon a particular investigation. By properly beginning their investigations at the Dental School during indoctrination and continuing them at different duty stations, valuable information can be accumulated after a number of years. Instruction in the technique of proper thesis preparation further decreases the burden upon the editor when such papers are submitted for publication. This form of research may be either of long or short range nature.

"The third subdivision of research possible in the Dental Corps of the Navy is that involving a long range investigation where effort is expended in many branches of the sciences directly related to some major problem. This includes the vast studies of field research.

"This last form is considered preferable because the cumulative

effort of individual investigation can be utilized and applied towards solving urgent dental problems and contributing more valuably to scientific information. In view of this cumulative effort, proper guidance of investigation along the route toward long range goals are instituted to accomplish conservation of effort. It is not intended that work of experimental and observational nature should be regimented, but because the Dental Corps is small and the time factor, which rotation of duty entails, is important, such regimentation at times is necessary. In addition, the diversity and immensity of probable investigation and experimentation demands curtailment and conservation of effort. Otherwise conclusions on gross problems undertaken cannot be obtained in any reasonable length of time. Rotation of duty alone requires the training of investigators so that progress towards solution of problems may continue after once being initiated at any duty station.

"The investigation undertaken must be of a nature which does not materially interfere with the routine duties of the dental officer. This in itself is extremely limiting to the scope of possible endeavor. However, at some future time when the feasibility of this program is known, full time research dental officers with proper support and material aid will be ordered to such duty similar to those medical officers now doing such work in the various departments of the Medical Corps. During the pursuit of

the investigation, other interesting and valuable factors that warrant further study may be brought to light. Such further study necessitates full time devotion by experienced dental officers properly trained in these fields.

"Reports on a few experiments or observations are discouraged whenever possible since statistically the value of significant results seems directly proportional to the number of such individual investigations made. Preliminary reports, of course, are encouraged, but emphasis is placed upon the preliminary character of such. As an arbitrary number it is suggested that at least 1,000 experiments or observations be made before statements of a reasonable conclusive nature are made or accepted. This eliminates to a great extent the questionable character of many conclusions so often reached by many investigators.

"The investigator is given every encouragement and aid. When and if the Bureau of Medicine and Surgery has once approved an outlined field research problem, it supports it throughout by making available to the investigator, specialists in various scientific fields attached to the Research Department of the Medical Corps. These include physicists, chemists, biologists, statisticians, etc. Here again, at present, the necessity of first attending to routine dental duties must be uppermost in the mind of the investigator. After a sufficient number of tests and observations have been made, the investigator is permitted to

continue his work to a final conclusion at the Naval Dental School. Here ... without interference ... he is permitted to devote specified periods of time to his problems. In this way he can organize and properly interpret any results he may have obtained as well as properly check for errors, utilizing the experience of those specialists already mentioned and attached to the Centralized Medical Research Department.

"When it becomes necessary to enlist the aid of all dental officers for pursuit of a specific problem means are at hand to quickly and efficiently gain the sum total of such desired information. Over a long period of continuous indoctrinational courses to newly commissioned dental officers, such co-operation is drilled into them and consequently this co-operation is more feasible than under other circumstances.

"Sufficient public notice is made periodically of the progress of any or all research efforts that are expended by the Naval Dental Corps. This is done by publication of preliminary reports on the various problems undertaken. The individual investigator is thus protected in regard to time, originality and credits.

"Since the practice of dentistry is concerned with two major problems; namely, dental caries, and oral pathologic conditions of soft tissues among which is parodontosis, it seems appropriate that cumulative efforts are expended upon problems directly related to the solution of these. This is in direct contradistinction to that method of investigation already mentioned which springs from

curiosity alone and has no purpose other than the establishment of fact whether related or not to any or all major problems. It is, of course, understood that investigations of any nature are not to be discouraged. However, emphasis is placed upon the desirability of conducting research relating to the principal long-range goals such as those suggested. Investigations in purely Naval dental problems, such as the relations of dentistry to Aviation and Submarine Medicine, must be included as long range problems. Publication of any results which might have military value, however, must be first submitted to the Coordinator of Naval Research via the Medical Officer in Charge of Medical Research and the Dental Officer in Charge of Dental Research.

"Finally after a number of years, if the program continues and responsible persons work is used, we may eventually possess data on investigations sufficiently covering the various phases of science relating to the gross problem to warrant some more definite diagnosis, etiology, or observation in the problem. Thus a worthwhile contribution to knowledge is developed.

"There are many advantages for research work in the Navy that cannot possible exist in civil life. Continuation of the projects which have been started and initiation of investigations of other problems, under concentrated, intelligent direction and with properly selected personnel should yield interesting results."

Professional.- From the commencement to cessation of hostilities

approximately 100 naval dental research investigations in all classifications were published or accepted for publication (143). Those published after 14 August 1945 but representing work conducted during the war are represented in the reference (144). Of these about ten were projects which were approved and supported by the Bureau of Medicine and Surgery (143, 144).

By the end of hostilities the position of the Research Division in the Bureau of Medicine and Surgery and the relation of Naval Dental Research as a component of this Division, as well as the Dental Facilities of the Naval Medical Research Institute, are illustrated in the organizational charts Nos. 25,26 & 27.

As the war progressed an office of rehabilitation was formed in the Bureau of Medicine and Surgery (145) in order to remedy, as far as possible, the results of war wounds, particularly in cases where amputations of arms, legs, hands, eye enucleations, etc., were necessary. The construction and application of prosthetic appliances was part of this office's activity, and requirements led to the establishment of a Prosthetic Appliance Board (146) at the National Naval Medical Center. This Board, besides medical officers and hospital corps officers, included several dental officers. In connection with the construction of prosthetic appliances, the Bureau of Medicine and Surgery approved the research project "Esthetic and Functional Hand and Digit Prosthesis and Eye Prosthesis", Project X-573, on 11 May 1945, initiated by the Comman-

ding Officer of the Naval Dental School, National Naval Medical Center, Bethesda, Maryland (147).

Among other projects, upon which reports were made but which as yet have not been published in civilian or other journals, were (147):

a. Research Project X-345, Efficacy of penicillin in the treatment of oral fusospirochetosis, proposed 11 February 1944 and approved by the Chief of the Bureau of Medicine and Surgery, 15 March 1944 (148).

This was the first attempt in the Navy to determine accurately and in sufficient numbers of patients, a method whereby large numbers of patients may be treated quickly and still keep the men on their duties. The intramuscular injections of penicillin were shown to be most effective. On 8 September 1944 (149) the final report was sent through official channels. In all 105 cases were treated and observed.

b. Project X-697, Study on caries occurrence in the same surfaces either bilaterally and/or adjacently, approved 29 December 1945. In progress (150).

c. Presence of Vincent's organisms in the mouth of patients being treated for syphilis.

d. A portable dental operating light for field use, Project X-664, approved 12 September 1945.

e. Effect of methyl methacrylate fillings on pulp tissue

of dogs, incompleted, Project X-41?, approved 4 July 1944.

f. Relationship of dental occlusion to ear block in the low pressure chamber, Project X-157, approved October, 1942.

g. Project X-434, approved 9 November 1944.

1. Results of dental therapy in 50 cases of aerotitis media in submarine personnel based upon a new functional concept of eustachian tube blockage.
2. A rapid dental treatment for the prevention of aerotitis media.
3. Evaluation of a dynamic concept of dental treatment based upon a functional classification of mal occlusion.
4. Dental treatment of trismus, tinnitus, otalgia and obscure neuralgia.

Personnel.- At the beginning of the war no dental officers were conducting investigations solely. Their routine duties of performing operative procedures on patients were expected of them. Consequently very few were interested in assuming additional responsibilities that research involved. This in itself was the best screening procedure possible since it quickly and effectively weeded out those dental officers who might be interested in research as a lark. By the end of the war two dental officers had been assigned to engage in dental research activities only, and both were attached to the

Naval Medical Research Institute (151). At present other dental officers have been assigned to Naval Medical Research Units located in Guam (147), and Cairo, Egypt. (147, 170). Facilities available at civilian dental schools (152) are being utilized in co-ordination with Naval Dental Research facilities and supported by Naval Medical Research funds. Thus naval dental education and research received its greatest impetus and support during World War II. With the setting of such strong foundations, progress in these two phases seems assured.

OBSERVATIONS - RECOMMENDATIONS - CRITICISMS and OTHER COMMENTS (165)

This chapter must necessarily be considered as unbiased a review as possible, of the observations, recommendations, criticisms and comments gathered from the personal histories of naval dental officers. Besides the shortages, expansion difficulties in materiel and personnel, and organizational complexities which are incident to any country at war, those observations are mentioned here which have been repeatedly made by more than one dental officer. It was difficult to separate data which applied only to local personal experiences, from that which could be valuable when incorporated in an over-all Naval Dental Corps series of policies for various dental activities. So many factors influenced much of the criticism and recommendations made by dental officers serving in the different

theaters of operation under varying circumstances that one was hard pressed to differentiate between the emotional and dispassionate forms of criticisms and recommendations. Consequently a measure was adopted by applying the question "is this criticism, observation, recommendation or comment one which, if adopted, might benefit the Corps as a whole or merely settle a comparatively minor local difficulty which might be due to clashes in personalities rather than basic errors in regulations or policies?"

The following observations, recommendations, criticisms and comments are thus screened:

1. Insufficient prosthetic facilities were available in the forward areas. The trailer or truck type operating units would have been a solution had they been developed soon enough to be made readily available.

2. Dental officers with administrative and organizational ability as well as actual battle experience should be placed in charge of dental facilities in forward areas or large dental activities . In this connection courses in administration might be given by competent instructors at the Naval Dental School and be a prerequisite for promotion or eligibility as senior dental officers in forward areas or large dental activities.

3. Dental officer personnel from civilian practice with little or no experience in military life or handling of large numbers of officers and enlisted personnel, are not considered suitable to place in charge of large dental installations in the majority of cases.

4. The hurried and selective form of dentistry, although objectionable, is the only solution during wartime. In this connection, civilian dentistry could help by increasing their educational program and making it available to the majority of civil populations. However, statistical (144-a,b,c,d,e) data still show a considerable shortage of dentists to accomplish all the dental treatment necessary in any given population.

5. To assume that all essential dental treatment can be accomplished by dental officers available in the ratio now authorized (1:500) prior to going overseas, in the time allotted and dental standards permitted in inductees during wartime, is erroneous. The solution seems to be to make more dental officers or time available per person in the service (consider #4).

6. During battle and in a lull it is absolutely necessary for medical and dental personnel to function as a unit for the welfare of the patient, rather than as separate entities. Such needs were never disputed on the actual battlefield or ocean theater of operation during and immediately after action.

7. Maxillo facial teams with medical and dental officers and corpsmen attached, are necessary to more efficiently handle large numbers of head and neck injuries.

8. There is need for enlisted personnel in the dental corps who have thorough stenographic and bookkeeping experience to more intelligently and efficiently handle the paper work and

keeping of files according to standards. Such instruction should be given by competent instructors at the Naval Dental School.

9. The clinical and instructional phases of naval dentistry should be separated to a greater degree than now, at those activities where instruction is given. Teaching is a science and can only be undertaken by properly trained personnel if the classes towards whom such instruction is directed are to benefit. To accomplish procurement of competent instructors, course of sufficient duration should be made available to carefully selected dental officers at pedagogical institutions or at naval educational centers employing well trained instructors.

10. Research must be given more support. Incompetent personnel should be definitely excluded from such duty. It is true that personnel not actually engaged in research have as their prime objective the treating of patients. While it is true that research personnel should periodically go back to clinical work in order to keep a proper perspective, most of their endeavor should be consumed in actual experimentation or observation. Research is more than a full time job and creative work requires all the concentration, energy and freedom from interference as possible. The heaping of additional duties on personnel engaged in research is to be discouraged.

11. The need for a sufficiently large reserve dental officer group with vigorous regular periodic training in military methods is

considered necessary. The time consumed in this war in adjustment, and the resultant discontent and misunderstanding might have been avoided to a very considerable extent had a more active reserve training program been possible. The pressure of war, differences in personalities and difficulty of private practitioners to adjust themselves to being a cog in a machine rather than the whole machine as they are in private practice, are considered the main difficulties to surmount in most dental activities during war. Here again it must be stressed that such differences seldom seemed evident on the battlefield or ocean theater of operation, during or immediately after actual engagements with the enemy or when common dangers are shared.

12. There seems to be need for a coordinator of dental research in the Division of Research, Bureau of Medicine and Surgery. (appointed 24 July 1946)

13. A dental officer with sufficient training in statistical methods should be attached to the vital statistics division, Bureau of Medicine and Surgery. By such liaison more data pertinent to dental activities might be made available and thus encourage more efficient administration of naval dental affairs.

14. It has been suggested that the duplicate of the present dental record be retained until operative treatment has been rendered and the results of a more accurate examination of the operator during treatment might be recorded before transmittal to the

Bureau. This would result in a more accurate record of the dental status of each patient on file in the Bureau for identification purposes.

15. It is recommended that bitewing and full mouth roentgenograms be made for each naval recruit and repeated at each reenlistment. In this way the Naval Dental Corps will have more data on the actual caries status and yearly increment of caries in large male populations than any other organization, when data procured from these X-rays are properly recorded and analyzed. Budgetary estimates may also be more accurately constructed and identification of unrecognizable bodies more accurate.

16. There seems need for the construction of a book on duties of a dental officer (in detail) aboard ship (various types), ashore (various type activity), when in an instructional or administrative capacity, etc.; one that would embrace indoctrinational as well as post-graduate activities in medico-dento-military aspects of the Navy.

17. A more thorough investigation should be made into the professional abilities of all dental officers, regular or reserve, in order to have such readily available when specialists in any phase are required, as when ordered to act as replacements of other officers with such special ability at any activity.

18. Regular rotation of duty between continental U. S., rear and forward areas, afloat and ashore after predetermined periods

should be particularly stressed during time of war. When this was initiated in the Pacific, morale was considerably improved among dental officers. For a professional man, arbitrarily a one year tour of duty in an active battle area is considered more than sufficient. This to vary depending upon the degree of battle activity in which the personnel are engaged. Such was the policy in the final year of hostilities.

19. More thorough and frequent inspections of dental activities are suggested to bring about more efficient functioning of dental activities. This is now being done by district dental officers.

20. The assignment of collateral duties to dental officers except in cases of emergency, should be discouraged. However, it is conceivable that in certain cases, depending upon the personality of the dental officer, his initiative and type of duty, such collateral duties are a necessity if for no other than morale purposes, particularly in an active theater of operation. Keeping busy seems a particularly effective antidote for fear during battle action or in areas where action is expected momentarily.

21. It was suggested that wooden boxes for portable dental equipment be replaced with metal in order to eliminate warpage that occurs in the tropics and when becoming wet.

22. Air conditioning is practically a necessity in ship's dental offices in the tropics. The humidity is generally at the

~~lex~~ dew point and the temperature well over 100°. In such environment, perspiration on the hands causes ready slipping of handpieces and dental instruments. Actual soft tissue damage has occurred on several occasions due to this. The force that has to be exerted on these instruments for dental operations is different than in soft tissue surgery. Consequently a slip can cause much more extensive damage.

23. A small prosthetic outfit should be available aboard all ships in which dental treatment is available to render at least emergency dental prosthetic service. This to include a small acrylic outfit to quickly construct acrylic crowns in the anterior region of the mouth in an emergency.

24. Use of X-ray therapy in facial cellutitis was considered of value by several dental officers attached to hospitals where such was available.

25. Dental equipment should go in advance of dental officers to insure availability upon arrival of officers. This is rather difficult, however, since the military situation may not always be predicted this far in advance.

26. Fitness reports on junior dental officers should be made out by the senior dental officer and forwarded.

MISCELLANEOUS

The subject of naval dental war prisoners, their experiences as well as activities will be treated next (153). These may be

classified under several general headings: (a) their experiences immediately before being captured while the Japanese were attacking the Philippines, (b) their activities and experiences while prisoners, and, (c) their experiences immediately prior to being liberated.

It appears that during the bombing of Manila and other points in the Philippines, dental officers attached to these areas were busy helping the medical officers treat the great number of wounded personnel. These dental officers learned much and found that they could be a definite help, particularly in treatment of jaw casualties which medical officers considered in the field of dentistry.

From the experiences that have been related by prisoners, it appears that at no time was the association between all personnel more complete, or on a more co-operative basis than during the time of attack and treatment of the wounded. The hospitals and other treatment stations had to be evacuated and temporary hospitals seemed to spring up miraculously over night. However, even these treatment centers became destroyed or had to be abandoned as the enemy pushed on. A partial insight into the difficulties encountered might be had when one considers that there was evan a scarcity of fresh, uncontaminated water.

The ingenious methods employed by personnel with incentive and creative ability to remedy shortages of materiel was amazing. In the case of dental amalgam, the alloy was obtained by filing

the Philippine pesos (which later had to be smuggled in), and the mercury, by heating calomel. Apparatus for sterilizers, chairs, cabinets, etc., were likewise constructed from bits of refuse found day by day here and there. In China war prisoners seemed to fare a bit better in dental equipment and supplies which could be smuggled in via civilians from supply houses scattered about. However, in the Philippines the supplies and equipment had to be constructed from crude materials in many instances. Instruments to remove teeth were many among which was the ordinary pocket knife. Apparently medical and dental officers became versatile in the use of a few instruments for a great many different treatment and surgical procedures.

It seems that after the casualties were treated and surrender was complete, naval medical and dental officers were permitted to practice their professions by the Japanese authorities. Treatment was rendered war prisoners mostly, but occasionally these officers were called upon to treat Japanese soldiers. As a result of treatment rendered the enemy, small special privileges were sometimes obtained.

The harsh and cruel treatment which was accorded prisoners has been explained as due to several things. As was presented by one prisoner, the language difficulties probably contributed more than anything else to the kind of treatment received. The prisoners and Japanese soldiers simply could not understand each other and

if response to an order was not quick enough, slaps and some beatings ensued. The form of discipline that was exercised on the Japanese soldiers and civilian population by the authorities, and the punishment for any breach, was not much different than that accorded the prisoners. The contempt which the American prisoners held for the Japanese was particularly difficult for the Japanese to understand, regardless of the beatings and other deprivations attempted to break the spirit of the prisoners.

Hunger, due to the very restricted diet was always the daily experience of most prisoners, yet few mouth lesions occurred which could be attributed to certain vitamin or other deficiencies. One prisoner particularly noted that in malaria cases the absence of vitamin C seemed to aggravate the condition and in some cases vitamin C was necessary in the recovery of the disease. Needless to say vitamins and other drugs simply were not available for treatment.

The sanitation problem was that of the prisoners, and medical officers assumed full charge in maintaining some degree of sanitation. In some cases the dental officer's aid was enlisted in enforcing observance of orders issued for such measures which would ensure the health of the prisoners to as great an extent as possible.

As the American offensive made the hopelessness of the Japanese situation more and more apparent, the desperation of

the Japanese became more acute. The results, already known, whereby all the war prisoners in one camp were killed (including one dental officer), and the brutal treatment accorded others in the attempt to move them to the Japanese homeland from the Philippines, testify to the desperation. It was again at this period, when the Japanese situation in the Philippines became untenable, that most war prisoners faced their most harrowing experiences. Trapped in holds of ships, ~~being~~ bombed and torpedoed by our own forces, shorn of all clothing, exposed to ~~in~~ frigid weather, deprived of food and water, fired upon by the Japs when attempting to swim ashore from sunken ships, all of these caused the death of a great many and represented a climax to a period of long suffering by all.

COMBAT EXPERIENCES

The following are war experiences as related by different officers (165). These were chosen because they generally relate the situation characteristic of most activities in the categories cited.

Pearl Harbor, T.H.-

"On 7 December 1941 the Dental Clinic, Navy Yard, Pearl Harbor, T. H., had a complement of ten dental officers. Five were engaged in operative, one oral surgery, and four in prosthetics.

"Lt. Commander R. P. Irons, on duty here at that time has given the following information, as all files are missing: Lt.

Commander Irons and all officers on duty were living in Honolulu. Only a telephone watch was stood. He was notified by an Army officer's friend of the Japanese attack. Doctor Irons had his wife notify all dental officers to report immediately to the Yard Clinic.

"They arrived around 0900 and assisted in the care of the wounded, as they arrived at the Dispensary. The dental technicians were sent out on rescue teams to various ships and areas in the harbor, and performed outstanding service. All personnel remained at the Dispensary constantly for the next two weeks and were able to continue the practice of dentistry on the second day following the attack. To relieve the Medical Officers of some watches, the Dental Department took over the watches from 2000 to 0600 on 8 December 1941, and continued for two weeks. No dental officer performed any outstanding service above his fellow officers and by the same token no dental officer shirked his duty. They all calmed down and performed smoothly under very trying circumstances.

"Dental officers from ships that were sunk, reported and the complement was increased to twelve or fourteen where it remained for many months. Some officers that reported were further ordered to ships leaving port, marine detachments, and outlying islands, with portable equipment. With this number of officers a seven day work week was started which permitted them to have every fourth day off. There were fourteen dental corpsmen on duty, seven of

which were engaged in prosthetics.

"Immediately following 7 December, the demand for dental prosthetics increased. Some two-hundred dentures having been lost by officers and men during the attack. Some of these were lost in the ships that were sunk, a large majority were lost in the oil covered water when the wearers became sick. The prosthetic department was able to replace these dentures for these patients within three months.

"The complement was raised to twenty officers in 1942. In August, 1943, it was requested that the complement be raised to thirty dental officers. In April, 1944 another raise in complement was asked for, this time to thirty-seven dental officers, the request was approved in May. When the change of complement was requested, it was also requested that a building with twenty-eight dental operative rooms be furnished. This being approved, an old office building was converted to this use. The description of which is as follows:

"The Dental Clinic originally constructed as a contractor's office building, located on the corner of 8th and E Avenues, was converted to its present purpose and occupied in July, 1944. It comprises approximately 11,000 feet of floor space, is two stories in height and of frame construction. It consists of : 28 operating rooms, 1 prosthetic laboratory, two waiting rooms, three locker rooms and heads, one store room, one issue room, one appoint-

ment room (office), one administrative office, one duty officers room, one duty corpsmens room, one line room, and one gear locker. It is inadequate for the demands placed on it, in that, space required for operative dentistry does not permit an office to be used for certain treatments, such as oral prophylaxis, periodontia, and stomatitis. It would also have been desirable to have a surgery recovery room, as all extensive cases were hospitalized. It was found necessary to start a class of indoctrination for the officers and men due to the many changes that take place from time to time, in reports, Yards and District orders, as well as those from the different Bureaus.

"The mission of the station is to build and maintain units of the fleet. The mission of this activity is to care for personnel of ships and shore establishments under its cognizance.

"The demand for dental service from the fleet and activities on the Islands were becoming greater as the war moved into the Pacific. It was then recommended to the Dental Division by the District Dental Officer that a double shift be started. This request was granted and additional officers were ordered. Then it was requested the complement be changed to seventy-two dental officers working seven days a week with one day off. This would enable a double shift, one shift working from 0730 until 1430 with one hour for lunch. The other from 1430 until 2100 with an hour for dinner.

"The demand for dental service continued increasing greatly. In October, 1944 a request was made for an additional building with twenty-five dental operating rooms which was disapproved."

U.S.S. BOISE (CRUISER):

"On 7 December, I was attached to USS BOISE, which was in the Philippines area. From then until July, 1942 our duties consisted largely of escort and convoy. During July we made an unescorted run to a point 650 miles off Tokyo, as a diversionary prelude to the Solomons campaign. Two planes and their crews were lost. On our return to Pearl Harbor the BOISE was sent to the Solomon area. We arrived the latter part of August, and participated in that campaign. Our job was scouting and patrol duty, and we also took up to Guadalcanal the first group of reinforcements on 17 September. After several unsuccessful attempts the BOISE finally made contact with the Jap task force known as the "Tokyo Midnight Express". The resulting battle on 11-12 October was known later as the Battle of Cape Esperance. It is thought that six (6) Jap ships were sunk. The BOISE took about 15 major hits. My battle station in the Wardroom was rendered untenable by one of these hits as was the sick bay area. After assisting in evacuating patients from the latter, I gave first aid to casualties in the only remaining dressing station aft until late the next morning, and then worked with the medical officers in treating casualties until about 1500 that afternoon. 107 were

killed outright. The dental office was behind four and a half feet of water and oil. Because of this the dental records could not be obtained to help in identifying the dead. After the wounded were cared for my duties consisted of helping to recover bodies from flooded parts of the ship and assisting in their subsequent burial ashore."

U.S.S. ENTERPRISE (CARRIER):

"I received dispatch orders on 1 April 1942, to report for duty aboard the USS ENTERPRISE. We left Pearl Harbor the day I reported for a rendevous with the USS HORNET which was carrying Army Bombers. I spent the day of launching for the Tokyo raid at General Quarters in the operating room, reading "The Volcanic Isles". It was an interesting book on life in Japan and it helped keep my mind off the momentary threat of land based enemy bombers. The withdrawal was without incident which made the next few raids seem less hazardous.

"After a hurried trip to the New Hebrides to deliver a small Marine Figher group to Efate we went back to enter the battle of Midway. Our air group suffered heavily but the ship received no damage in this action. In August the ENTERPRISE was hit and near-missed several times while in support of the Guadalcanal Operation. Bombs exploded below decks both forward and aft of the sick bay. Debris and smoke filled the sick bay area making the location of the hit difficult. I felt my way over the deck to find a way to

a smoke-free compartment to evacuate the injured. I found that the gas mask made breathing more tolerable, even though it furnishes no oxygen, and used a bulkhead lantern to return to the sick bay. After a search in all corners and under bunks I finally located the patients and injured crowded in the little six by six laboratory with the door held shut in an attempt to keep out the smoke in spite of the fact that there was a raging fire on the other side of the bulkhead. We led the men out to a safer place and after that action the Senior Medical Officer established all battle dressing stations on the hangar deck or above. It was found to be easier to go to a damaged area than to feel one's way from below deck to a damage-free area and then return for the evacuation of injured. We had a large number of dead and injured to be cared for but previously organized Battle Bills functioned adequately. Our next damage occurred in the action in which the HORNET was lost off Santa Cruz in October, 1942, and again a large number who killed and injured. The Dental personnel again performed first aid duties with the Medical Department. Damage from this bombing was quite extensive but the ship could not be spared from the action area so the ships' force and Construction Battalion men from New Caledonia set to work. Reports were received that the "Tokyo Express" was moving down again so the ENTERPRISE went out to intercept, taking the Sea Bees along to continue emergency repairs which included getting number one

elevator back in commission. No contact was made and other actions in the succeeding few months were carried out without damage to the ship."

U.S.S. MOUNT HOOD:(EXPLOSION):(Ammunition Ship)

"At 8:47 on the morning of 10 November 1944, while lying at anchor in Seeadler Harbor, Manus Island, in the Admiralties, the fourteen thousand ton ammunition ship MOUNT HOOD exploded. Manus Island is 6,249 miles southwest of San Francisco via Honolulu and the Marshall Islands, and only 254 miles off the northeast shore of New Guinea. It is estimated that in addition to her own complement of 348 crew and officers aboard at the time (five enlisted men and one officer were ashore), approximately 150 more died as a result of the explosion. Five hundred yards off the MOUNT HOOD's starboard bow lay the USS MINDANAO (ARG-3). Her sister ship the USS CEBU (ARG-6) rode at anchor three hundred yards further on and in a direct line with the MOUNT HOOD. A number of smaller ships lay alongside the USS CEBU in the process of being repaired. Less than two hundred yards away on the CEBU's starboard stern lay the flagship USS ARGONNE. All of these ships suffered loss of material and men, particularly the MINDANAO.

"Words cannot describe adequately the awfulness of this catastrophe. The noise was inconceivable. In some instances ear drums were split wide open. If one can imagine placing one's head in a metal chamber and permitting sledge hammers to strike all

sides simultaneously, then one can gleen some idea of this appalling experience. The air all about was literally saturated with exploding bombs. One of the numerous eight inch shells to hit our decks landed almost directly over the dental clinic. It left a two foot square hole. It was a cud. Men who have participated in at least three different invasions and who witnessed the MOUNT HOOD explosion, say that for sheer frightfulness, the two experiences are not comparable.

"At the time of the explosion I was sitting at my desk in the dental clinic. This is situated far forward on the starboard quarter below the main deck. My Corpsman, ~~George Altaffer, PhM 3/c.~~ was preparing the tray for surgery. At the sound of the first explosion no one moved. We were too stunned. Somehow one got the feeling that the bulkheads were caving in. The room, which I believed thoroughly clean and ready for inspection, filled with a cloud of dust.

"At a time like this thoughts cease to follow a normal chronological sequence. I thought we had been rammed by another ship. A crack in the hull near the air compression or remained a curt reminder of a like accident, although not serious, of the week before. A lapse of only a few seconds and the second explosion was heard, every bit as demoralizing as the first. The ship began to rock violently; a tidal wave over thirty feet high caused by the first explosion had hit our port side. The officer in charge

of one of our forty foot motor launches, ~~Ensign Eugene Rankin,~~ who was returning from the beach with the guard mail, said he could not see over the top of this wave. He said it was like "being down in a deep hole". The coxswain of this boat, ~~Robert Burgess,~~ had his head blown off while holding the tiller.

"After the second explosion I thought the ammunition magazine directly below the next compartment forward (sick bay) had exploded. The explosion was so intensely loud I was certain that it was somewhere within the ship. I dashed out into the main passageway; it was jammed with starry-eyed men. Then came the third and fourth reports in rapid succession. Would they ever cease. Someone yelled "air raid". I had expected at any second to hear the general quarters sounded. I started for my battle dressing station below deck just forward of the fan tail.

"I reached the ladder leading up from the crew's forward berthing. I could go no farther. The passageways were too packed with humanity. I dashed up the ladder and started running over the top side. As I ran I noticed big holes in the deck where eight inch shells had struck. I noticed numerous pieces of shrapnel lying about and large oxygen tanks knocked askew. I saw ~~James Samuels, S 1/c,~~ a boy who had sung in our orchestra, lying near the ladder leading to the sick bay. He had been decapitated. The thought flashed through my mind that ~~Big Sam~~ would never sing again. My roommate, ~~Lt. John Taylor, USNR,~~ was within two feet of

Samuels when he was killed. Had I gone the length of the ship the scene would have been the same.

"I reached the quarter deck. Not until then did I know what had happened. I looked across the bay, the MOUNT HOOD had disappeared beneath the surface -- 14,000 tons of steel had sunk in less than six seconds.

"The medical supplies from the mid-battle dressing station locker were broken out. I set up a first aid station near the gangway on the quarter deck, a fire and rescue gear chest for a table, electrical shore outlet boxes for medicine and bandage trays. Patients began coming in over the side in a steady stream, some on stretchers, some ambulatory, some living and some dead. Boats from other ships came alongside, discharged their human cargo on our landing barge at the foot of the gangway.

"The most critical cases were sent forward to the sick bay where our ship's surgeon, Lieutenant William Johnson, MC, USNR, was already busily operating. The least injured were treated at the first aid station. Jerome Rubins, PhM 2/c. and two pharmacist mates from ships alongside were designated as my assistants. It seemed no time before word was passed that the sick bay, the treatment room and the medical passageways were filled to overflowing. Patients were then laid out on the deck in the Chief Petty Officer's Mess. That, too, became filled. Finally no more patients could be accommodated below.

"The first major injury treated at our first aid station was a fractured femur, right leg. After slitting the trouser legs with a huge pair of awning scissors, the clothes were ripped off. A large purplish swelling was in evidence high up near the thigh. By gently palpating the area the lower bone fragment could be felt. The epidermal tissue was not punctured. The conventional wide taped loop was hung below the sole of the foot and secured in place by tape wound around the ankle. The leg was slipped through a Kelly-Bake splint and made secure. Gauze bandage material was passed through the loop and tied to the foot end of the splint. Two tongue depressors were passed between the strands of the gauze and twisted, stretching the leg and bringing the bone fragments into position. An "M" on the forehead indicated that morphine had been administered. The patient was removed from the improvised operating table and placed on the deck.

"The next patient had a long scalp wound. His face looked chalky, his mouth twitched a little, and his eyes became glassy. I looked up and saw Lieutenant Taylor, my roommate, he too, had seen the man die. I requested that the body be removed to the fan tail where an armed guard stood watch over the dead. For the first time in my life I felt the presence of a superior being.

"Many of the victims were so caked with dried oil they were hardly recognizable as human beings. Some had been blown off the decks of their ships, later to be lifted into life boats from a

sea of oil. At one time I had two patients lying on the deck with tourniquets about their legs. Coincidentally, each had severed arteries, caused by deep cuts over the right ankle. One man had an ear missing, another a leg severed at the shoe top. Only a thin piece of flesh held it to the body. The strand was cut and the foot and shoe tossed aside. Facial and head injuries were numerous. All were cleaned, merthiolated, sprinkled with sulfanilamide powder and bandaged where indicated. Some of the patients were literally clothed in bandages.

"The sun blazed down so relentlessly patients, after given treatment, were transferred to the deck of the ward room. Soon this room held so many injured one could scarcely step between them.

"An excited pharmacist mate from one of the smaller ships tied alongside, came aboard. He requested that a doctor be sent to his ship at once. A man was dying; he was told to stretcher his patient and bring him aboard. He left hurriedly. A moment later he returned. A doctor was no longer needed.

"That night the movies went on as usual. I noticed that no one laughed at funny remarks, or did they whistle when a pretty girl came on the screen. Too many of their buddies had been sent ashore bound in canvas, later to be placed in plain wooden boxes and buried.

"Funeral services for all denominations were held on Sunday, November 12, at 1000 on Manus Island. The CEBU Chaplain, Commander Tennyson, officiated, assisted by a priest, a rabbi and a protes-

tant minister. Row upon row of small white crosses stuck into freshly dug graves met the eye as we walked from our boat to the cemetery. Soon many more graves would be dug to accommodate the more critical cases that were sure to pass on. When the prayers were said, a squad of sailors wearing dress whites fired three volleys of shots. Then a moment's pause. A bugler standing high on a nearby hill sounded taps. This concluded the ceremony. It had been breathtakingly solemn. It had been heartrending. It had impressed one with the futility of it all.

"Two months have gone by since the MOUNT HOOD explosion, and two impressions remain indelibly imprinted on my mind. The first is the heroic manner in which the injured suffered their misfortunes. I heard not a single complaint from any of them. The second was the sight of our sister ship the USS MINDANAO. Only that morning I had paused a moment on my way to the dental clinic to admire her outline, her freshly painted grey and white hull, her blue awnings, fore and aft, protecting the crew from a relentless tropical sun and those over the boat decks for the comfort of her officers. She looked like a cruise ship. The next time I saw her the paint and all of the awnings were gone. The big boom was shot away and most of her super-structure was badly damaged. Her port side was riddled with shells, leaving large openings in her hull. One bulkhead of the Captain's cabin was blown out, as were bulkheads in the port officers' cabins.

Her top side was not unlike a sieve. She was a dirty blackened hulk, but she still managed to remain afloat.

"Last Sunday, January 6, 1945, ~~Lieutenant Taylor~~ a lieutenant and I were luncheon guests of the MINDANAO's skipper, ~~Captain Evans.~~ We were taken on a tour of the ship. Except for a few dents here and there, too small to be hardly noticeable, and a hole in the skipper's cabin, which had been caused by the penetration of a desk lamp, (the lamp had missed his head by inches) one would never know what a terrible ordeal the MINDANAO had gone through. Around this lone remaining hole in his cabin, Captain Evans had painted a wide circle. Above this circle, in big black letters, are printed the words, "MISSED" ...MOUNT HOOD Explosion, 10 November 1944."

U.S.S. VINCENNES (CRUISER):

"During the early morning hours of 9 August 1942 surface ships of the Japanese Navy successfully attacked and sank my ship and other nearby cruisers. This action was later designated as the Battle of Savo Island.

"During the battle the sick bay was destroyed by shell fire and the Senior Medical Officer, Commander J. D. Blackwood, Jr., (MC), USN, and all the corpsmen except one were killed. It seems of interest to note that the man on the operating table receiving treatment at that time, escaped from the compartment and survived.

"Casualties of various types came to my dressing station for medical treatment. Many were burned, one was without an arm, one crawled in with a leg dangling and with his face and arms burned, others had fragment wounds.

"While administering first aid which consisted mostly of applying battle dressings, stopping hemorrhage, and relieving pain, our compartment received direct hits from enemy shells. One of the corpsmen received a fractured leg. Later, as the ship listed, the compartment began filling with water. I sent a metalsmith who had reported to us with minor burns to find an escape hatch while the one remaining corpsman and I moved the medical supplies and the patients away from the inpouring water.

"A usable escape hatch was found in the compartment forward and through it we hoisted all the patients that were in a state of consciousness. Upon my arrival at the topside I found that the ship had been abandoned. I walked across the starboard side of the ship which was now facing skyward, slid down into the water and upon looking back before a minute had passed, I could see the ship's stern pointed sharply into the air and then it disappeared quickly beneath the surface of the water.

"Later, after finding a raft, many wounded were lifted aboard and given first aid. Before abandoning ship, I had pocketed morphine surettes and burn jelly, both of which were used to treat the wounded aboard the raft.

"Soon after daybreak we were rescued by the destroyer MAYFORD. The wardroom was converted into an emergency operating room where the seriously wounded were treated. The weather deck of the ship was covered with both dying men and those not so seriously wounded. All members of the Medical Department who were not seriously injured gave treatment to men as they were brought aboard.

"In the afternoon of August 9, all survivors were transferred to a transport that proceeded promptly to Noumea, New Caledonia. The first two days and nights were spent in removing fragments and debris and dressing wounds.

"I returned to San Francisco via Samoa and Hawaii six weeks after the battle of Savo Island and received orders to report to the Superintendent, U. S. Naval Academy, Annapolis, Maryland, for duty."

U. S. S. SOLACE -(HOSPITAL SHIP):

"This report will deal very briefly and essentially with battle casualties, particularly with maxillo-facial cases, and a few statistics will be presented for study. However, it should be clearly remembered that these figures represent an unfair minimum. In other words, there were considerably more maxillo-facial injuries embarked on this vessel than the figures would seem to indicate...and, here is the reason for the discrepency. Frequently, casualties were brought aboard with a diagnosis of

"Multiple Wounds", and for examples' sake, thoracic injuries and intra-cranial wounds would certainly take precedence over maxillo-facial injury. Critical cases were given a minimum or no maxillo-facial treatment at all, and oftentimes the critical period extended over and beyond the duration of the evacuation trip. So, in many of these cases the dental officer didn't even see the patient since the maxillo-facial injury may have been a secondary or tertiary reason for admission. And, therefore, many maxillo-facial cases were admitted under "Multiple Wounds (Critical)", and were not included in the statistics offered herein. These figures involve only those cases in which treatment was instituted in the SOLACE.

O.K.

Maxillo-Facial Battle Casualties

Operational Theatre	Mandible	Maxilla and or Malar Bone
Tarawa.....	11	3
Kwajalein.....	3	1
Eniwetok.....	11	3
Saipan(2operations).....	14	4
Guam (2operations).....	13	4
Iwo Jima (5 trips).....	28	10
Okinawa (7 trips).....	23	9
Totals	103	34

"A total of a minimum of 137 fractures within the domain of maxillo-facial surgery is not a highly impressive figure. I

know from personal experience that the U. S. Naval Hospital in San Diego was admitting an average of about 15 jaw fractures per month during most of the war. That adds up to more fractures seen in a year than the SOLACE saw throughout the entire war. But the type of casualty seen at the mainland hospital differs greatly from the fresh battle wounds seen in a hospital ship, and the problems in the latter instance are considerably more complicated. A careful review of the photographs presented with this report will reveal the extreme type of battle casualty that the dental officer of this war had to manage in the forward areas.

"It is interesting to observe that mandibular fractures were three times more common than maxillary fractures. Often, patients were embarked that presented frightening lacerations of the face, with occasional exposures into the antrum of highmore, and occasional parotid fistulas, and yet the maxilla somehow avoided serious fracture (fracture by which the upper jaw is completely separated from the rest of the skull). Simple fractures of the alveolar process usually presented no problem other than the decision as to either extract or not to extract the teeth involved in the fracture. The most difficult fractures to handle were comminuted fractures of both jaws. Fortunately, these were relatively uncommon. Chemo-therapy was routinely employed in the maxillo-facial ward. An attempt was made at maintaining the blood level of penicillin and sulfadiazine, using 20,000 units of penicillin intra-muscularly

every three hours throughout the critical period supplemented with intra-oral sulfadiazine, 30 grams every six hours. I am not prepared to discuss chemotherapy in this report, but I can state clinical observations, and it is my present belief that penicillin and sulfonyl therapy are in a large measure directly responsible for the drastic reduction of post-injury infections. Where we expected infection, somehow we didn't get it. Oftentimes, it was necessary to work with only the meagerest pretense at asepsis, and even here we saw very little serious infection. Certainly the benefits of chemotherapy cannot be minimized.

"The statistics substantiate the experiences of the SOLACE in pointing out the fact that the Iwo Jima campaign was perhaps the bloodiest. Thirty-eight patients with fractured jaws were evacuated in three trips. The sailing time from Iwo Jima to the nearest base hospitals at Guam was about 48 hours. On the evacuation trips from Iwo Jima those 48 hours meant just that much constant, uninterrupted work. The base hospitals on Guam were wonderful and highly efficient organizations, and it was with a feeling of security for our patients that we unloaded there.

"The Okinawa campaign ran a close second to Iwo Jima. Here more burn cases were seen than at any other time since Pearl Harbor. Also, more sailors were casualties in the Ryukyus area than any other action in which the SOLACE had participated. The

Kamikaze attacks on Fleet Units were, of course, responsible for this. The sailing time from Okinawa to Guam was 4 to 5 days. We appreciated that time to observe the effectiveness of our treatment.

"When this vessel functioned as a Fleet Station Hospital, (such as at Manus and Ulithi) the dental service along with EENT) was certainly the most over-worked department aboard. One of the most frequent messages received on the signal bridge was a request for "so many dental appointments" for "such-and-such" ship. It became quite obvious that here was an excellent indication for the expansion of operative and prosthetic activities. More of this type of dentistry might have been concentrated at Fleet Anchorages, and at no time in this area were there enough dental officers to meet the crying demand. (This report is not meant as and administrative criticism, but is simply a report of generalized observations, some of it ferreted out of records, case histories, wardroom chatter and personal exposure).

"The maxillo-facial surgeon is particularly useful to a hospital ship during the embarkation of fresh casualties and the subsequent evacuation trip to the nearest base hospital. His chief advantage lies in the institution of early treatment, and early treatment of fresh facial injuries is so particularly important from the esthetic angle. I do feel that the maxillo-facial surgeon is needed on hospital ships, but I also feel that perhaps the

greatest indication for a maxillo-facial surgeon lies at base hospitals established nearest to the action theaters...such as the base hospitals at Guam. Here a more permanent form of treatment planning can be insituted, and upon these activities depends the success of the case. The definitive work can easily be carried out at a stateside hospital but it is so important to fully organize the early treatment planning in maxillo-facial cases.

"If I were personally seeking a maximum of maxillo-facial experience and had my choice of assignments, I would first of all choose a base hospital accepting fresh battle casualties (the fresher the better); secondly, I'd want a hospital ship that evacuated casualties from the beach as directly as possible (as via LST or LCI). Casualties that are evacuated second-hand (as via Transport) may be from several days to many days old; Thirdly, I'd select duty at a large mainland hospital that handled the definitive work of maxillo-facial cases. That roughly, represents my present concepts of the needs of a maxillo-facial service in the Navy.

"By far the most distressing traumatizing agent experienced by our troops in the Pacific was the high explosive fragmentation shell. The wounds suffered by this weapon were extensive, gaping, and with considerable loss of tissue. Over 60% of our patients were victims of one form or another of high explosive fragmentation shells. The enemy's use of the mortar shell was perhaps more

efficient and more effective than any other weapon he possessed. Other types of traumatizing agents considered were: (1) Bullets which comprised less than 30% of the wounds. (2) Operational trauma which accounted for almost 3% of our casualties, and (3) Miscellaneous trauma (enemy inspired) such as "booby traps", etc., which accounted for about 2½% of our casualties. It is interesting to note that our own incidence of operational trauma was higher than enemy-inspired miscellaneous trauma.

"I was impressed with the many tracheotomies performed right on the beach-head in the instance of maxillo-facial injury. The simple and uneventful manner in which these patients recovered from tracheotomy sold me on the benefits of this operation. In all cases that had a tracheotomy, the patient was comfortable and resting well in spite of gross swelling and damage to facial tissues.

"Another and more dramatic first aid surgical procedure frequently instituted by the battalion physician in the front lines for the express purpose of checking severe hemorrhage due to facial injury was the ligation of the common carotid artery and the internal jugular vein. I thought the ligation of the external carotid artery might have solved the problem in the cases brought to my attention, but I didn't fully realize the difficulty of dissecting and identifying anatomical structures in a bleeding patient with both the doctor and the patient under enemy gunfire. It is considerably more expedient to locate and ligate the common carotid

artery than it is to dig for the external carotid branch, and after all, the operation is considered as a heroic last-minute, life-saving gesture anyway. In two of these cases I saw the clearly defined symptoms of Horner's ocular syndromes and throughout my entire period of observation the ocular symptoms did not seem to improve any. However, the patients were very much alive and were undergoing maxillo-facial treatment.

"In the large majority of comminuted fractured jaws that were embarked on the SOLACE it was the general policy to establish adequate drainage as soon as possible. For this purpose a rubber through and through Penrose drain was usually the method of choice. Where any facial bone was exposed the tissues were not sutured tightly without a Penrose drain.

"It is particularly desirable to have all dental cases concentrated in one ward, the maxillo-facial ward. The psychological benefits alone are worthy of setting up such a ward. These patients prefer to remain together. They wear the same or similar type of appliances, bandages and submit to similar type of treatment and medication. A nurse or a senior corpsman is always on watch to supervise medication, diet, and in other ways follow out the maxillo-facial surgeon's orders.

"The dental activity was established aboard the SOLACE in early 1941 and by Navy Day, October 27, 1941, she had joined the Fleet at Pearl Harbor. First only one dental officer was assigned

to the ship but shortly thereafter a prosthodontist was added to the staff. Two dental officers handled the load until the vicious Iwo Jima and Okinawa campaigns; then a maxillo-facial surgeon was added in what turned out to be a beautifully timed assignment of personnel. These two actions required the service of a maxillo-facial man more than any other actions experienced by the SOLACE. The ship's complement was roughly in the vicinity of 400 men, but the average number of personnel dependent upon this activity for treatment varied with the ship's assignment. When serving as a Fleet station hospital as many as 100 patients were treated on some days. On evacuation trips from the action beachheads, the voyage to the beachhead was spent in organizing the personnel and material set-up to handle a maximum number of severely wounded casualties; the return voyage, whether it be the 4 or 5 days running from Okinawa to Guam, or the 48 hours from Iwo Jima to Guam, always provided more work than could be easily handled by the entire personnel.

"There were dental problems other than strictly maxillo-facial that were met and solved on these evacuation trips. Frequently, casualties admitted under diagnoses other than dental required dental treatment, that is, these cases had fractured teeth that needed either extraction or protection, lacerated oral tissues, broken prosthetic appliances, etc. Every effort was made to please the patient both from a maxillo-facial and prosthetic aspect,

and where the prosthesis

was concerned, these efforts were frequently made with an elastic interpretation of regulations for the welfare of the wounded veteran. It was not uncommon to observe a patient that was more concerned over the loss of the incisal angle of an upper central incisor than he was over a compounded fracture of his tibia. Whenever time permitted, this type of esthetic, prosthetic dentistry was attempted."

U.S.S. CASCADE (DESTROYER TENDER):

"November 4, 1942, I was ordered to the USS CASCADE for outfitting and to be aboard when commissioned.

"The crew was stationed at Treasure Island, so permission was obtained to use one operative unit at the Dispensary for examination and treatment of those personnel awaiting the completion of the ship.

"Aboard the CASCADE, ample space of 24' x 14' with three ports was provided on the portside amidship, main deck. The office was equipped with two Ritter Units, Ritter chairs, Weber X-ray, air compressor, Castle lights, two desks and a large steel cabinet. An extra steel locker was obtained so that all dental material was stored and secured in the dental quarters.

"The ship was commissioned on 1 March 1943, and the Dental Division was in full operation at this time with two dental officers assigned. After some alterations to the ship at Mare Island Navy Yard, and a shake-down cruise we proceeded to Pearl

Harbor, arriving there 19 June 1943.

"The tremendous amount of dental treatment needed by destroyer personnel was immediately apparent. The crews of those destroyers coming alongside, those in the Navy Yard and personnel of shore based ComDesPac were cared for. A third dental officer and a third operating unit were authorized in August, 1943.

"The ship left Pearl Harbor in November, 1943, and proceeded to FunaFuti in the Ellice Islands. Here the need of dental treatment for personnel of destroyers, tankers, AK's, LST's, and shore based Seabees was tremendous. The lack of small boats for transportation from those ships without dental officers to the three or four with dental facilities prevented or delayed the treatment of personnel badly in need of dental care.

"The ship remained in Funafuti until February, 1944, and then proceeded to Kwajalein, Marshall Islands. The same situation as to dental treatment prevailed here. At this time dental supplies were running short, due to delay in receiving supplies requisitioned on 1 October 1943, 1 January 1944, and 1 April 1944. We left Kwajalein on May 20th for Majuro, remained ten days and then returned to Kwajalein. While there, five or six Japanese civilian prisoners were brought aboard for dental treatment (surgical). It was apparent that they had received no dental care whatever. Even the small children had no deciduous teeth which were not carious.

"I was detached from the CASCADE 11 June 1944 and reported to the USNTC(U.S. Naval Training Center), San Diego for duty 27 July 1944.

"The Navy Dental Corps has accomplished in a creditable manner a task never before attempted. However, it is suggested, in the event of future emergencies, that:

a. A larger Reserve Corps be maintained.

b. Essential dental treatment be accomplished in training and embarkation areas.

c. Greater attention and more practical instruction in oral hygiene be given to Navy personnel.

d. Ships or barges be equipped and supplied as dental and medical infirmaries, to be sent or towed to temporary bases or staging areas, for the care of those ships' crews having no medical or dental officers.

e. A Staff or Area Dental Officer be assigned with authority to distribute personnel for treatment.

f. The allowances of anesthetics, alloy, handpieces and dental X-ray film for ships that are not apt to return to a port for extended periods, be increased.

"It has been a valued privilege to be a member of the Dental Corps of the United States Navy."

U.S.S. WISCONSIN (Battleship):

"On 1 May 1944 the Dental Department was ready to begin routine treatment procedure. The organization (copy of which is here enclosed and which has been submitted to the Dental Division, Bureau of Medicine and Surgery) has been prepared and made a part of the official Medical Department Organization. The matter of assigning personnel to specific details and their instruction was begun. At this time only three dental technicians were assigned to the Dental Department. Later a fourth was sent from the Medical Department. Routine examination of dental records was begun and classification and treatment of ship's company was continued. In this connection, the co-operation of all department heads and division officers was extremely gratifying. The Dental Department was particularly indebted to Commanding Officers ~~Rear Admiral E. E. Stone and Rear Admiral J. W. Roper, and Executive Officers Captain G. O'Keefe and Captain D.F. Eddy~~ and Executive Officers in permitting appointments and dental requests to appear in the "note" section of the Plan of the Day. This facilitated a degree of efficiency in treatment procedure which otherwise might not have been attained. The Executive Officers made it a point particularly to stress the need for co-operation with the Dental Department at quarters (Operations permitting) during times when it was felt too many appointments were being missed by personnel.

"The Medical Department was particularly helpful in their understanding of the Dental Department's problems. The Senior

Medical Officer's educational program to the dental officers and the dental technicians, directed toward first aid, intravenous anesthesia, plasma administration, and operating room procedure was especially helpful and of very practical value when later occasions demanded such knowledge. His encouragement to witness major surgery was likewise a decided aid. By rotating dental technicians and hospital corpsmen in the various departments, a trained emergency reserve of dental technicians and hospital corpsmen was made available. This was also initiated by the Senior Medical Officer, and although a bit difficult at first, proved to be of decided advantage later.

"The WISCONSIN arrived at Ulithi on 9 December 1944, and left the next day to participate in the Leyte Operations. By 31 December 1944, new H-4's with much additional detail had been constructed for 2739 officers and men representing 96.7% of ship's company. This figure did not include approximately 470 officers and men who had been transferred since commissioning, for a great percentage of whom new H-4's had been constructed and dental treatment undertaken. At this date 61 or 2.19% had not been examined, over half of whom were officers; 153 (5.49%) required prophylaxis only, 1063 (37.59%) were incomplete but not urgent, 260 (9.1%) required urgent treatment, 1295 (45.17%) were completed until the next routine period of examination, and 20 required dental prosthesis. Fifteen patients had received prosthetic appliances

constructed at the various dental activities since commissioning. Those still requiring prosthesis were being treated whenever a station or ship where such treatment was possible was in the vicinity. Details of treatment rendered was submitted in routine Form-K.

"It was interesting to note that 197 or approximately 7% showed oral fusospirochetosis and 119 or 4% showed gingivitis in varying forms with a reduction occurring in the ensuing months. Other than treatment and educational procedure were considered responsible. Among the factors absent in that theatre of operations were: no contact with civilians, no mineralized water and absence of alcoholic beverages. Further studies using carefully controlled methods are contemplated.

"A system of sterile treatment procedure had been adopted in the Dental Department, details of which appear in another article. Although it is agreed that this method was not perfect, it still was felt that it was superior to routine methods employed. It is believed that this was one factor which led to the decision of using the dental office for treatment of minor head and neck injuries, in addition to jaw fractures, during a lull in battle. The sick bay could be relieved of much congestion during such times when hits should be made on the ship by using the dental office. Fortunately, during the whole cruise and in the various operations, such hits were never sustained, although the ship did treat severe war wounds in personnel from other ships.

"While attached to the WISCONSIN, the ship participated in the following official actions:

"11 December to 24 December 1944, Leyte Operation, strikes on Luzon, P.I.

30 December to 26 January 1945, Luzon Operation -- participated as a unit of the carrier air attack which included

3-4 January 1945 strikes on Formosa Island.

6-7 January 1945, strikes on Luzon, P.I.

9 January 1945 strikes on Formosa Island.

12-14 January 1945 strikes on Camranh Bay and Saigon Bay, French Indo China, having entered the South China Sea through the Bashi Channel.

15-16 January 1945, strikes on Hong Kong, China, and Formosa Island.

20 January 1945, repelled night enemy plane attack made on ships of our Task Force in Ballington Channel off Luzon Strait.

21 January 1945, strikes on Formosa Island. (During this time we took aboard about 12 severely wounded men from the Destroyer MADDOX which had received a near miss by a kamikaze).

22 January 1945 strikes on Okinawa- Ryukyu Islands (Nansei Shoto Chain).

10 February 1945 to 5 March 1945 Iwo Jima operation, par-

ticipated as a unit of the Carrier air attack which included the following:

16-17 February 1945 strikes on Tokyo, Japan...the first concentrated carrier strikes on Japan's homeland in this war.

19 February 1945 strikes and support of the operation for the invasion of Iwo Jima Island, repelled night enemy air attack made on ships of the Task Force in the Iwo Jima Island area.

20-21 February 1945 strikes and support of the operation of Iwo Jima Island. 21 February 1945, repelled night enemy plane attack made on ships of the Task Force in the Iwo Jima Island area.

25 February 1945 strikes on Tokyo, Japan.

1 March 1945 to 21 July 1945 - participated as a unit of the carrier air attack striking force which included the following: Strikes on Kyushu, Shikoku and Southwestern Honshu. Under repeated enemy air attack made on ships of this Task Group in the Kyushu area. This Task Group destroyed and assisted in the destruction of many enemy planes. Bombarded Okinawa Shima, and Kutaka Shima in preparation for invasion of Okinawa Shima. Strikes and air support of ground troops on Okinawa Shima. This Task Group destroyed and assisted in the destruction of many enemy planes.

Strikes on Tokyo. Northern Honshu and Hokkaido. Day bombardment of Muroran, Hokkaido, night bombardment of Hitachi-Mito area on Honshu.

"It was during the Okinawa operation that this ship participated very actively in repelling suicide plane attacks. On 19 March 1945 we shot down the first Jap kamikaze of which we were certain, a two motored Betty which had dropped a bomb on a carrier immediately astern of us and then made a dive at us. It was early Sunday morning before church services when this occurred. Immediately prior to that a plane had flown into the middle of the Task force formation and dropped a bomb on another carrier. Attacking suicide planes made runs on our group again that afternoon, and our gunners shot down one and assisted in others. All during the operation our ship received credit for shooting down three planes and assisting with four others. For several days thereafter alerts and general quarters at all hours of the day and night were the rule. Additional suicide planes were shot down in the ensuing course of events. From 17 March for 63 days thereafter the ship steamed, without anchoring, in and about Okinawa and Kyushu, participating as a unit in the strikes made by the carriers of the Task Force. Our force bombarded Okinawa with their main batteries, as well as a few islands east of it.

"On 19 March the FRANKLIN was severely damaged by two kamikaze planes. She was in another Task Group but we could see her explosions.

"On 7 April 1945, our own immediate Task Group was sent to

intercept a Jap surface force, including their newest battleship, a large light cruiser, two smaller light cruisers and a number of destroyers. All but three of the destroyers were destroyed by the attack planes of our group. As far as can be determined this Jap Task Force was supported by a large plane force and was to attack the ships in the landing on Okinawa. The plane support was destroyed almost completely and left the surface force at the mercy of our Group's planes.

"During this operation, which proved to be the most severe and costly for the U. S. Navy in men and ships in all its history, more wounded men were taken aboard. This time from another destroyer, the USS MCDERMOTT. All dental personnel did their job well, particularly in view of the fact that "bogies" were on the screen continually and alerts and general quarters were being sounded. The wardroom tables in the ship were used for emergency treatment of these patients. The Senior Medical Officer suggested that all dental personnel assist there with one Medical Officer. The other medical officers were in sick bay operating on patients whom we had sent down after treatment. Dental personnel administered plasma, morphine, removed clothing, washed and dressed wounds and treated burns. Our ship was not hit during the whole time this officer was aboard and we all considered ourselves very lucky.

"From 10 July to 15 August in the operations against the Japanese homeland a commendation was received from the Commanding

Officer in consideration of "the efficient performances during the day bombardment of Muroran, Hokkaido 15 July 1945, and the night bombardment of Hitachi-Mito area on Honshu on 17 July 1945." A downed carrier pilot was rescued by one of our planes near Kyushu Bay on 8 June 1945.

"On 21 July 1945, this officer was transferred at sea during a fueling period."

EUROPEAN THEATER

"As a matter of personal history at this duty, it was interesting to experience life in war time in metropolitan London. Since living accommodations were of personal choice, there being no Government quarters furnished, I chose to live in a modern 800 room hotel in the city not over five blocks from my office. About ten days after my arrival in London, I experienced my first air raid by German bombers. From then on they came every night at least once and often two or three times during darkness. There were no military duties for me during these raids other than to stay "dispersed", and to be within telephone call of the dispensary. So my time was my own. Feeling useless at these times while London was being raided and seeing a shortage of air-raid-wardens at my hotel, my offer of being willing to help was promptly accepted by the civilian manager of the hotel, and I was assigned to a civilian air raid post located in the same building, and given the job as "roof spotter". This duty consisted of locating any fallen bombs or fires seen from the roof

and relying the information via telephone to the aid raid post in the cellar from where fire and rescue parties were dispatched. Upon the sounding of an alert at night, I ran to the roof and took part in these operations where I could plainly see the raids from this high point, atop an eight story building. On 15 March 1944, during a severe incendiary raid, I spotted several large fires within the near area. I received a letter of gratitude from the senior air raid warden on this occasion which I quote: 'Dear Sir: Although you may consider it a mere trifle, we on this Fire Guard Post thank you most warm-heartedly for your assistance on the night of March 15th during an incendiary raid. Your presence on the roof enabled me to withdraw two valuable Fire Guards who were urgently required for Trailer Pump Crew. To my mind, such co-operation does more to cement Anglo-American friendship than all the diplomatic meetings. Yours faithfully, R. A. MONKS.'

"The raids came spasmodically until 12 June 1944 shortly after D-day. The plane raids stopped only to be substituted by "buzz-bombs". After the 3rd day of the robot raids which were mounting in number up to over a hundred a day, it was considered useless to continue further "roof-spotting" as it was not only dangerous to be exposed to the terrific blast of these bombs, but certainly evident to anyone within miles around as to where they had hit. From this time on my time was spent wherever I felt "safe". About two months before my detachment, the rocket-bombs came; these

were no warnings of the approach of these missiles as they came through the stratosphere at a speed faster than sound and the noise of their approach could not be heard until after the sound of their explosion. After being detached, I asked the senior air raid warden at the post in the hotel just how many alerts I had experienced during my time in London--the answer was 552."

MARINES ...SOUTH PACIFIC

"At the time of the Pearl Harbor disaster, I was with the FIRST Marine Division, Fleet Marine Force, then encamped in tents at New River, North Carolina. I had reported as Division Dental Officer on 3 March 1941, while the Division was at Guantanamo Bay, Cuba. At this time the tables of organization allowed one dental officer to each regiment and medical company, and one for Headquarters Company Headquarters Battalion. With a full division of three infantry and one artillery regiment and five medical companies, this allowed ten dental officers for a division reinforced of twenty thousand. There was no allowance for a division dental officer, consequently I was attached to Headquarters Company, Medical Battalion as a sort of spare. This over-complement position caused considerable recurrent irritating confusion, especially on troop movements based on complement.

"The equipment, both medical and dental, consisted of old World War One field units in sad state of depletion and repair. However, a new supply table had been issued and the task of disposing

of the old units and the equipping of the medical and dental department with full field equipment according to the new supply table was given to the Division Dental Officer. As the new units were very difficult to obtain, this involved complications, and it was not until just before embarking for overseas in July of 1942 that all medical and dental units were completely equipped and reserve supplies at hand.

"The Division returned from Cuba in May, 1941 and was encamped at three locations: Parris Island, the Norfolk area, and Quantico. It was while at Quantico the first of the new field units arrived, and a complete field hospital was set up for inspection by the Surgeon General and the Chief of the Planning Division, Bureau of Medicine and Surgery. It was during these inspections that suggestions for changes in equipment were approved, one of which resulted in the addition of the field operating light to the dental unit. We were thus able eventually, to equip each dental officer with a field unit which included an electric engine, Castle field light and foot engine in case of current failure. A portable field generator supplying current was included in the units issued each Regimental Medical Unit, Medical Company and Headquarters Company, Headquarters Battalion.

"In October, 1941 the Division began to assemble in the tent camp area at New River. The weather was bitter that winter. New equipment arrived very slowly and operating with the old units in

tents even with an oil stove was rugged work.

"The dental condition of the troops was deplorable since in the emergency they were arriving with little or no treatment. The few dental officers attached, even by working commendably, could not hope to correct the condition of any large percentage of the personnel. The condition was not to improve greatly with the entry into the war, primary emphasis on training, movement overseas, and combat conditions. Arrangements were made with the Army at Camp Davis, fifty miles south, to care for the few prosthetic dental cases that presented since a field prosthetic unit was not included in the Division Medical equipment at this time.

"In the spring of 1942, the THIRD Brigade was organized which took from the Division the SEVENTH Regiment and two medical companies with, of course, the three dental officers attached. Thus, as the FIRST Echelon of the division embarked for overseas in May, 1942, there were eight dental officers attached.

"Arriving in Wellington, New Zealand, in June, two dental units were set up in a small temporary hospital near the docks which had been taken over from the New Zealand Army, most of whose personnel were then in the Far East.

"Two more units were put in operation at Paekakariki, forty miles to the north, where feverish construction of a camp was underway in the cold rains and mud. Only emergency treatment could be attempted, especially since all hands were busy day and

night moving gear from ships to camp...only to reverse the procedure as the rest of the division arrived and we were all aboard for Guadalcanal 22 July 1942.

"The dental officer attached to Headquarters Battalion was left with the rear echelon at Wellington. The dental officers attached to the FIRST, FIFTH, and ELEVENTH Regiment and A,B,and C, Medical Companies, in addition to the Division Dental Officer, embarked. An accident aboard ship on 3 August prevented the B Company, Dental Officer from landing. This left six dental officers who hit the beach at Guadalcanal 7 August 1942. After three weeks the failing eyesight of the dental officer in A Medical Company necessitated his evacuation which left five; still ample to man the three offices we managed to set up and keep in operation through the ensuing months of bombings and shellfire.

"A report of this action was included in the secret report sent in by the Division Surgeon, Captain Merwick T. Brown, (MC), USN; briefly, the dental officers operated chiefly as Assistant Medical Officers. Enemy action, more than lost equipment, prevented establishing more offices until later. Approximately five weeks later, the SEVENTH rejoined the division, together with "C" Medical Company. Both dental officers had complete outfits which were successfully unloaded. Since the SEVENTH was engaged immediately, the dental equipment was used to augment that in use. In October the C Medical unit was set up, giving us four dental

offices with seven dental officers aboard. In November three dental officer replacements arrived, filling our complement. While all hands were needed for Medical assistance, there was no opportunity at this time to use them in their strictly professional capacity.

"The Division began withdrawal from Guadalcanal on 9 December 1942. The following six weeks in the brush outside Brisbane, Australia, were a bit of a nightmare of rain, mud, lost and misplaced equipment, and few supplies. Sufficient equipment was finally located in the scattered dumps to establish offices in five areas. Some supplies were secured from the Army, including a field prosthetic unit. Then came the order to pack up for Melbourne and the usual loss of equipment recurred.

"At Melbourne, camps were established in and around the city and dental officers placed accordingly. The rear echelon had rejoined with the dental officer still well supplied and equipped. The attempts to secure supplies and equipment from the Army under whose command we now were, proved to be a tedious and near fruitless task for the next few months. Most of the Army had moved to Sidney, and little supplies and practically no equipment was available locally. All Division reserve medical supplies and equipment left in Wellington, N. Z., originally were later moved to Noumea, New Caledonia, and were now unavailable to

us. Requisitions submitted to the Army at Sidney had not been heard from up to the time I left the Division 10 May 1943. At this time we had eight units in operation.

"It was during this non-combat status of the Division that a crying need for dental officers to take care of the crushing load of work became apparent. Recommendations made through the Division Surgeon later resulted in the increase by twenty of the Marine Division Dental Officer Complement, as well as the official recognition of a Division Dental Officer, and addition of one field prosthetic dental unit to the equipment of a Division."

another marine report:

"Reported to Medical Field Service School, Camp Lejeune, New River, North Carolina, 1 June 1943. The instruction received here aided immeasurably in understanding problems -- military and medical -- to be confronted in the field.

"Reported to "E" Company, FOURTH Medical Battalion, FOURTH Marine Division, 24 July 1943, leaving North Carolina for Camp Pendleton, California, 11 August 1943. An extensive training program was undertaken during the remaining months in the states. Working in conjunction with the medical officers, the dental officer instructed corpsmen in first-aid, field hospital organization and junction, and medical problems, possibly to be faced in the future.

"Debarked from San Diego and traveled directly to Noi-Nemur,

Kwajalein, Marshall Islands. Medical companies functioned on ship because of the lack of land area during this operation. Transports designated to relieve casualties, laid in the lagoon, received wounded from the beach evacuation stations. Dental officer served in screening cases, caring for all oral and surrounding facial injuries, and administering to shock cases preoperatively.

"Returned to advance base, and were joined by the 21 dental officers that were to form the Dental Section. This brought the total number of dental officers in the Division to 32, since eleven had originally been assigned when the Division left the U. S. Construction at the advance Base originally hampered the setting up and function of the dental section. The Senior Dental Officer, however, despite difficulties, succeeded in devising a system of individual clinics in each regimental area, and allocating the required number of officers to each clinic.

"Transferred to the 20th Marine Regiment on 6 May 1944. The Medical Department in this Regiment formed the Shore Party Evacuation Stations. The Division moved out to Saipan. On this operation, one medical officer, myself, and eight corpsmen landed with the seventh assault wave to set up the evacuation station on Beach Blue 1. Personal functions included rendering the most definitive treatment possible under the circumstances to casualties

before evacuation to transports and hospital ships, and directing the recording of evacuees; continuing in this function until approximately D plus 12, we were relieved and returned to regimental command, thereafter treating civilians and enemy soldiers confined to stockades.

"Debarked 23 July 1944 on LST's prior to Tinian assault landing with a combat team at H plus 20 minutes on 24 July 1944. Here again working with two medical officers and fifteen corpsmen, an evacuation station was established, and functioned as such during the entire operation. Received the Navy and Marine Corps Medal for this operation.

"Returned to our Advance Base. Was transferred back to the Medical Battalion as dental officer in "B" Medical Company, and assumed duties as dental officer in division dispensary.

"Debarked for Iwo Jima and subsequent to initial landings; received casualties on board APA until D plus 3, when landed. While on transport, this officer worked on minor surgical cases, doing debridements and dressings and gave all the Sodium pentothal anesthesia in the O.R. operated by our medical company. After landing D plus 3, and until D plus 11, our company ran an evacuation station on the beach, my duties corresponding with those on the two previous operations. On D plus 12, our company moved to form part of the FOURTH Division Hospital. My function here was in the Receiving Room doing minor surgical procedures, preparing shock cases for surgery, and working in the O.R. as anesthetist.

"Concerning duties with the Marine Corps, the following observations have been made:

1. Dental officers assigned to the Marines should have either had previously, or through an intensive course after assignment a good working knowledge of anesthesia.

2. Dental officers should not be assigned unnecessarily to duty beyond regimental headquarters while in combat. One dental officer was killed on Saipan while working in a battalion aid station in front lines at a time when there was a full quota of medical officers in the Division.

3. If past conditions prevail again in the future, it should be endeavored to entirely complete the dental needs of Marine Divisions before their assignments in the field. Because of the constant mobility of these divisions, innumerable difficulties are encountered in setting up dental facilities. If all necessary work were done prior to leaving the continental limits, the number of dentists at present assigned to a division could be somewhat reduced. Proper and full utilization of all these dental officers in the field is sometimes impaired by the lack of facilities such as adequate construction and

lighting which are constant problems, met especially by units in a transient status. In other words, utilization of a few more officers within the continental limits would accomplish more than a comparable number in the field. If the original men and subsequent replacements sent out were completed, the number of dental officers needed in the field would be reduced because of the decreased workload.

4. Since work in the field presents the least desirable working conditions possible, and a tour of Marine duty would broaden all officers' conceptions of the medical, dental and military problems presented in land operations, it would seem advisable to give all young officers a tour of duty with the Fleet Marine Force."

MARINES (CONTINUED):

"In closing, I would like to condense the above. To be happy and to adapt oneself for life with the Marines in the field:

Remember your college days of give and take, share and share alike.

Know your anesthesia techniques.

Know your first aid.

Be prepared to give intelligent lectures if called upon by either the corpsmen or by the battery commanders.

Keep your mouth closed and eyes and ears open till you

Know what goes on out in the field.

Be ready and in physical condition so you can pitch in and work.

Be ready to improvise and do the best you can with what you have rather than talking about what you used to have or should have.

"If you remember the above mentioned points, and you like an outdorr life or true independent duty, then you cannot hope for any better duty.

"The above mentioned events occurred from May, 1943 through August, 1944 on the Islands of Wallis, Ellice, and Gilberts."

Naval dental officers who were killed, wounded, taken prisoners, who received decorations and citations and other data are here listed (62,63,74,153,154,155,156,157,158, 159,160,161, 162,163,165,171, and 172).

OFFICERS OF THE U.S. NAVAL DENTAL CORPS

KILLED IN ACTION

Lt. Commander Hugh R. ALEXANDER (DC), USN, U.S.S. OKLAHOMA, Pearl Harbor, T.H., 12-7-1941. Home ... Belleville, Pennsylvania. Awarded - Purple Heart ... posthumously.

Lieut. Edward A. BAUMBACH (DC), USNR, U.S.S. JUNEAU, Battle of the Solomons. Reported missing in action 11-13-1942; declared dead 7-19-1943. Home ... New Orleans, Louisiana.

Lieut. Thomas P. CAPPS (DC), USNR, U.S.S. LISCOMBE BAY, ship torpedoed in Pacific Battle of the Gilbert Islands, 11-25-1944. Home ... Topeka, Kansas.

Lieut. James S. CATE (DC), USNR, FOURTH Medical Battalion, FOURTH Marine Division, Marianas, 7-24-1944. Awarded - Bronze Star Medal ... posthumously, for heroic service while attached to TWENTY-THIRD Marines. Home ... Baker, Oregon.

Lieut. Commander Thomas E. CROWLEY (DC), USN, U.S.S. ARIZONA, Pearl Harbor, T.H., 12-7-1941. Awarded - Purple Heart ... posthumously. DDE named in his honor. Home ... St. Louis, Missouri.

CATE TERRACE:

Honoring Lieutenant James Stewart Cate (DC), USNR, of Baker, Oregon, - Bronze Star posthumously -

While attached to Twenty-Third Marines, Fourth Marine Division, during action on Saipan and Tinian Islands from 15 June to 25 July 1944, he voluntarily accompanied the regimental medical section in extremely hazardous operations. Lieutenant Cate repeatedly went to aid of wounded despite peril of intense enemy artillery and mortar fire, and treated and evacuated stricken men with heroic disregard for his own personal safety until he himself was mortally wounded.

Citation Underneath also.

The above named terrace is located on the reservation of the beautiful new U.S. Naval Hospital, Houston, Texas, to be commissioned 4 September 1946.

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KILLED IN ACTION (CONTINUED)

Lieut. Stanley E. EKSTROM (DC), USNR, U.S.S. BIRMINGHAM, Asiatic, 10-24-1944. Home ... West Concord, New Hampshire.

Lieut. Gilbert F. GORSUCH (DC), USN, U.S.S. ERIE, Atlantic Area, 11-12-1942. Home ... Pocomoke City, Maryland.

Lieut. Commander Earl O. HENRY (DC), USNR, U.S.S. INDIANAPOLIS, declared dead 9-13-1945; missing ... August, 1945.

Lieut. (jg) Stephen M. LEHMAN (DC), USNR, FOURTH Medical Battalion, FOURTH Marine Division, Saipan, 7-4-1944; Awarded - Bronze Star Medal, 7-17-1945. Home ... South Pasadena, California.

Lieut. (jg) Thomas R. McINTYRE (DC), USNR, U.S.S. FRANKLIN, Asiatic, 10-30-1944. Home ... Minneapolis, Minnesota.

Lieut. Edward J. O'REILLY (DC), USN, U.S.S. ASTORIA, Battle of Solomon Islands, 8-24-1942. DDE named in his honor. Home ... Chicago, Illinois.

Lieut. Robert B. SEEGAR (DC), USNR, U.S.S. TERROR, 5-1-1945, Home ... Springfield, Ohio.

Lt. Commander Laurice A. TATUM (DC), USNR, U.S.S. WASP, Battle of the Solomon Islands, 9-15-1942; received Navy Silver Star award; DDE named in his honor. Home ... Birmingham, Alabama.

KILLED IN ACTION (CONTINUED)

Commander Wadsworth C. TROJAKOWSKI (DC), USN, U.S.S. LEXINGTON, Battle of Coral Sea, 5-8-1942. Home ... Schenectady, New York.

Lieut. Miller C. WONN (DC), USNR, U.S.S. BISMARCK SEA, 2-21-1945. Home ... Ft. Atkinson, Wisconsin.

NOTE: All officers killed were automatically awarded the Purple Heart.

OFFICERS OF THE U. S. NAVAL DENTAL CORPS

WOUNDED IN ACTION

Lieut. Vernon L. ANDERSON (DC), USN, U.S.S. WASP, Pacific Area, 9-15-1942. Awarded - Purple Heart. Home ... St.Cloud, Minnesota.

Lieut. Paul G. ASH (DC), USNR, U.S.S. FELAND, 6-16-1944. Home ... South Bend, Indiana.

Lieut. Commander John W. DOYLE (DC), USNR, U.S.S. MARYLAND, Asiatic, 11-29-1944. Home ... Beverly Hill, California.

Lieut. Frank E. FRATES (DC), USN, U.S.S. VESTAL, Pearl Harbor, T. H., 12-7-1941. Awarded - Purple Heart. Home ... Atherton, California.

Lieut. Martin J. GELB (DC), USNR, U.S.S. THOMAS STONE, Mediterranean Area, 6-4-1943. Home ... Irvington, New Jersey.

Lieut. Joseph R. GRYSBECK (DC), USNR, U.S.S. ST.LOUIS, 10-25-1944. Home ... Chicago, Illinois.

Lieut. Howard B. HAISCH (DC), USN, U.S.S. BROOKLYN, Atlantic Area, 11-30-1942. Awarded - Navy Silver Star. Home ... Los-Angeles, California.

Lieut. Walter A. HALL (DC), USN, U.S.S. QUINCY, Battle of Solomon Islands, 8-9-1942. Awarded - Navy and Marine Corps Medal for heroic action on sinking of U.S.S. QUINCY. Home... Long Beach, California.

WOUNDED (CONTINUED)

Lieut. John W. HUGHES (DC), USNR, U.S.S. JOHN PENN (Torpedoed and sunk off Lunga Point, S. I.) 8-13-1943. Home ... Miami, Florida.

Lieut. Clarence L. INGRAM (DC), USNR, U.S.S. GAMBIER BAY, Asiatic, 10-25-1944. Home ... LaGrande, Oregon.

Lieut. Wilmar F. LANGE (DC), USNR, 133rd Naval Construction Battalion, 2-19-1945. Iwo Jima, 2-19-1945. Home ... Cranford, New Jersey.

Lieut. John F. O'DONNELL (DC), USNR, FOURTH Medical Battalion, FOURTH Marine Division, ~~2-20-1945~~. Home ... Boston, Massachusetts.

Lieut. Victor A. PETRICKA (DC), USNR, U.S.S. FRANSHAW BAY, Pacific, 6-17-1944. Home... Olivia, Minnesota.

Lieut. (jg) Harland W. RICHARDSON (DC), USNR, U.S.S. FRANCKIN, 4-19-1945. Home ... Grosse Point, Michigan.

Lieut. Franklin R. SCHALLER (DC), USNR, U.S.N. BIRMINGHAM, 7-4-1945. Home ... Minneapolis, Minnesota.

Lieut. Marcin TOPPER (DC), USNR, THIRD Medical Battalion, THIRD Marine Division, Pacific, 7-26-1944. Home ... Chicago, Illinois.

OFFICERS OF THE U. S. NAVAL DENTAL CORPS

MISSING IN ACTION

Lieut. Charles W. HOLLY (DC), USN, U.S.S. LANGLEY, Java, 3-1-1942. Home ... Catoosa, Oklahoma.

Lieut. Commander Farrel W. KEITH (DC), USNR, U.S.S. HOUSTON, Java, 3-28-1942. Home ... Pueblo, Colorado.

OFFICERS OF THE U. S. NAVAL DENTAL CORPS

PRISONERS OF WAR

Lieut. Commander James A. CONNELL (DC), USN, Philippines, 5-6-1942; captured at Santa Schoolastica College, Manila, P.I., departed from Bilibid Prison Camp, 12-13-1944 for Japan; ship sunk en route. Reported deceased 12-14-1944. Home ... Wilkes-Barre, Pennsylvania.

Commander Cornelius T. CROSS (DC), USNR, Philippines 5-6-1942. Liberated from Bilibid Prison, Manila, P.I., 2-4-1945 and returned to United States. Returned to duty in June, 1945. Home ... Manila, P.I.

Commander Claud M. FRALEIGH (DC), USN, Philippines, 4-9-1942. Departed from Bilibid Prison Camp, P.I., 12-13-1944 for Japan; ship sunk en route. Released from another prison 8-1945. Returned to United States, September, 1945. Received Army Silver Star for gallant action in Army Field Hospital. Home ... Gulf-port, Mississippi.

Lieut. (jg) Robert G. Harthneck (DC), USN, Philippines, 5-6-1942. Died in prison camp 4-19-1943. Home ... Staten Island, New York.

Lieut. Henry C. KNIGHT (DC), USN, Philippines, 5-6-1942. Trans-ferred to Palauan. All personnel in this camp killed by Jap-anese between 2-4-1945 and 2-25-1945. Officially reported deceased September, 1945. Home ... Norfolk, Virginia.

PRISONERS OF WAR (CONTINUED)

Commander Harry B. McINNIS (DC), USN, Guam, M.I., 5-7-1942. Has been reported at Zentauji, Shikoku Island, Japan, and also at Woosung, China. Liberated September, 1945. Home ... Enid, Oklahoma.

Commander Emmet L. MANSON (DC), USNR, Philippines, 5-6-1942. Released 2-1945, from Cabanatuan Prison Camp. Returned to duty in June, 1945. Home ... Worthington, Minnesota.

Commander Wade H. MORGAN, Jr., (DC), USN, Philippines, 5-6-1942. Captured at Santa Schoolastica College, Manila, P.I., departed from Bilibid Prison Camp 3-5-1944 for Japan; liberated and reported to Pensacola Hospital, September,1945. Started 90 days leave on 9-21-1945. Home ... Pensacola, Florida.

Commander Eric G. F. POLLARD (DC), USN, captured at Peiping; prisoner of war at Shanghai, 1942, later reported at Woosung. Home ... Minneapolis, Minnesota. Returned to United States.

Lieut. (jg) Warren D. Sargent (DC), USN (Ret)(inactive), American National detained by enemy in Philippines 5-6-1942; had been residing in Philippine Islands. Departed 10-1-1944; ship rumored sunk. Officially reported killed or died while a prisoner of war on 9-21-1945.

PRISONERS OF WAR (CONTINUED)

Commander Stanley W. SMITH (DC), USN, Philippines, 5-6-1942. Captured at Santa Scholastica College, Manila. Departed from Bilibid Prison Camp 3-15-1944 for Japan. Home, Morris, Illinois. Returned to United States, October, 1945.

Commander William L. STRANGMAN (DC), USN, Philippines, 5-6-1942. Departed from Bilibid Prison Camp, 3-5-1944 for Japan. Was released August, 1945. Received Army Silver Star for Defense of Corregidor. Home ... Santa Monica, California.

Commander James L. WANGER (DC), USN, Philippines, 5-6-1942. Captured at Santa Scholastica College, Manila. Departed from Bilibid Prison Camp 3-5-1944 for Japan. Liberated and returned to United States, September, 1945. Home ... Philadelphia, Pennsylvania.

P.9.

Lieut. Alfred F. WHITE (DC), USN, ~~Philadelphia~~, 5-6-1942. Departed from Bilibid Prison Camp, 12-13-1944 for Japan; ship sunk en route. Reported deceased, date of death 1-31-1945. Home ... Charleston, Massachusetts.

U. S. NAVAL DENTAL CORPS

CASUALTIES

Deceased While Serving Outside United States (not in action):

Lieut. (jg) Thomas G. CHERIKOS (DC), USNR, reported missing in action after transport plane on which he was a passenger was unreported from 8-16-1942 in Pacific Area; not enemy action. Attached to Eighth Construction Area, Dutch Harbor, Alaska. Date of death established as 8-17-1943. Home ... St. Louis, Missouri.

Commander James L. LEE (DC), USNR, Fleet Hospital No. 116, died of injuries not enemy action. Home ... Norfolk, Virginia.

Lieut. Fred M. STONE (DC), USNR, died 1-31-1944 from wounds received in tropical storm; EIGHTY-EIGHTH Construction Battalion, Pacific Area. Home ... Denver, Colorado.

Lieut. John T. WILLAND (DC), USNR, died 12-2-1944 at Naval Advance Base, Espirito Santo. Home ... Baltimore, Maryland.

U. S. NAVAL DENTAL CORPS OFFICERS

DECORATIONS and CITATIONS

Lieut. Commander Hugh R. ALEXANDER (DC), USN, Awarded Purple Heart — posthumously — killed in action, U.S.S. OKLAHOMA, Pearl Harbor, T.H., 12-7-1941. Home ... Belleville, Pennsylvania.

Captain Theodore D. ALLEN (DC), USN, Unit Citation, Mobile Hospital No.2, Pacific Area. Home ... Glouchester, Massachusetts.

Commander Vernon L. ANDERSON (DC), USN, Wounded in Action; awarded Purple Heart; U.S.S. WASP, Pacific Area 9-15-1942. Home ... St. Cloud, Minnesota.

Lt. Commander Henry M. ANDREWS (DC), USNR, Awarded Bronze Star, Iwo Jima.

Commander Charles H. BERCIER (DC), USN. Letter of Commendation from COMMANDING OFFICER, U.S.S. COLORADO. Home ... Elton, Louisiana.

Commander Rush L. CANON (DC), USN. Letter of Commendation from Commander in Chief, Pacific for distinguished service during Japanese attack on Pearl Harbor, 12-7-1941, while attached to the Naval Air Station. Home ... Carson, Iowa.

Lieut. James S. CATE (DC), USNR. Bronze Star Medal awarded -- posthumously — for heroic service while attached to the TWENTY-THIRD Marines, FOURTH Marine Division, during action against Japanese forces in the Marianas 7-24-1944. Home ... Baker, Oregon.

DECORATIONS AND CITATIONS (CONTINUED)

Captain Cornelius T. CROSS (DC), USNR, Bronze Star Medal. Prisoner of War in Philippines from January, 194- to February, 1945. Home ... Manila, P.I.

Lieut. Thomas E. CROWLEY (DC), USN. Awarded Purple Heart - posthumously. Killed in action, U.S.S. ARIZONA, Pearl Harbor, T.H., 12-7-1941. DDE named in his honor.

Lt. Commander Charles E. DONILON (DC), USNR, Presidential Unit Citation/, Guadalcanal.

Commander Bernard H. FAUBION (DC), USN. Letter of Commendation from the Surgeon General of the Navy. Home ... San Francisco, California.

Captain E. DeWitt FAULK (DC), USN, Commendation Ribbon, Guadalcanal.

Lt. Commander Donald L. FLEGAL (DC), USNR. Awarded Silver Star (Saipán). Home ... Bellefonte, Pennsylvania.

Lieut. Rex B. FOSTER (DC), USNR. Letter of Commendation. Home ... Waterloo, Iowa.

Commander Claud M. FRALEIGH (DC), USN. Legion of Merit; Army Silver Star for gallant action in Army Field Hospital in Philippines in 1942; Purple Heart; Unit Citation with Star; Army Unit Citation with two oak leaves; prisoner of war; released and returned to United State, September, 1945. Home ... Gulfport, Mississippi.

DECORATIONS AND CITATIONS (CONTINUED)

Commander Frank E. FRATES (DC), USN. Wounded in Action, awarded Purple Heart, U.S.S. VESTAL, Pearl Harbor, T.H., 12-7-1941. Home ... Atherton, California.

Lt. Commander Martin J. GELB (DC), USN, Purple Heart 6-4-1943, while serving in ~~United States.~~ U.S.S. Thomas Stone.

Commander Howard B. HAISCH (DC), USN. Wounded in action, awarded Navy Silver Star, U.S.S. BROOKLYN, Atlantic Area. Home ... Los Angeles, California.

Commander Walter A. HALL (DC), USN. Wounded in action, U.S.S. QUINCY, Battle of Solomon Islands; awarded Navy and Marine Corps Medal for heroic action on sinking of U.S.S. QUINCY 8-9-1942. Home ... Long Beach, California.

Lt. Commander Solomon M. KOZOL (DC), USNR, Served with EIGHTH Marines at Tarawa; awarded Presidential Unit Citation. Home ... Boston, Massachusetts.

Lieut. (jg) Stephen M. LEHMAN (DC), USNR. Killed in action with FOURTH Medical Battalion, FOURTH Marine Division, Saipan. Bronze Star Medal on 7-17-1945. Home ... South Pasadena, California.

Commander Daniel F. LYNCH (DC), USNR. Abdon Calderon, Second Class by Government of Ecuador.

DECORATIONS AND CITATIONS (CONTINUED)

Captain Francis M. LEPESKA (DC), USN. Letter of Commendation from the Surgeon General of the Navy. Home ... Minneapolis, Minnesota.

Commander Kenneth L. LONGEWAY (DC), USN. Commendation by CinCPAC (Commander in Chief, Pacific Area), Pearl Harbor, 12-7-1941. Home ... Council Bluffs, Iowa.

Rear Admiral Alexander Gordon LYLE (DC), USN, Commendation by the Secretary of the Navy with authority to wear Commendation Ribbon. Home ... Glouchester, Massachusetts.

Lieut. John I. McDOWELL (DC), USNR. Presidential Unit Citation, with Marines at Guadalcanal and Tarawa. Home ... Maysville, Kentucky.

Lt. Commander Steven F. McGRATH (DC), USN, Purple Heart with Gold Star.

Commander Harry B. McINNIS (DC), USN, Commendation by the Secretary of the U. S. Navy with authority to wear Commendation Ribbon. Prisoner of War in Japan from 1942 to September, 1945. Home ... Enid, Oklahoma.

Commander Emmet L. MANSON (DC), USN. Bronze Star Medal; Purple Heart; Army Unit Citation with one Oak Leaf. Prisoner of war in the Philippines from 1942 to January, 1945. Home.. Worthington, Minnesota.

DECORATIONS AND CITATATIONS (CONTINUED)

Commander Wade H. MORGAN Jr.,(DC), USN. Army Unit Citation. Prisoner of War in Philippines from January, 1942 to September, 1945. Home ... Pensacola, Florida.

Lieut. John F. MORTELL (DC), USNR. Bronze Star Medal, Marianas 7-17-1945. Home ... Oshkosh, Wisconsin.

Commander William A. NEWMAN (DC), USN. Letter of Commendation from Secretary of U. S. Navy for courageous action during the Battle of Savo Island 8-9-1942 while attached to the U.S.S. VINCENNES. Home ... Waukegan, Illinois.

Lieut. Albert Reed Oesterele (DC), USN, Bronze Star.

Lieut. Edward J. O'REILLY (DC), USN. Killed in action, U. S.S. ASTORIA, Battle of Solomon Islands, Pacific August, 1942. DDE named in his honor. Home ... Chicago, Illinois.

Captain Everett K. PATTON (DC), USN. Bronze Star Medal; Staff of Commander in Chief, Pacific. Home ... Atlanta, Georgia.

Lt. Commander Jacob RUTTER (DC), USNR. Letter of 2-26-1945 from Commanding Officer, U.S.S. MINDANAO to BuPers, commending Dr. Rutter for most outstanding performance of duty during an explosion on the U.S.S. MOUNT HOOD. Home... Upper Darby, Pennsylvania.

DECORATIONS AND CITATIONS (CONTINUED)

Commander Roy E. SCHAEFFER (DC), USN. Awarded Navy Silver Star for conspicuous gallantry as Boat Division Officer on the U.S.S. PRESIDENT ADAMS during landing operation on Gavutu Island 8 and 9 August 1942. Home ... Amherst, Ohio.

Commander Elmer W. SCHUSSLER (DC), USNR. Commendation by Commander in Chief Pacific Area for service during attack on Pearl Harbor, T.H., 12-7-1941. Home ... Chicago, Illinois.

Lt. Commander Herbert A. SMITH (DC), USNR. Awarded Bronze Star Medal for action with THIRD Marine Division on Bouganville. Home ... Clayton, Alabama.

Commander Stanley W. SMITH (DC), USN. 2-Bronze Star Medals; Army Unit Citation; Purple Heart. Home ... Morris, Illinois.

Commander John L. STOCKTON (DC), USNR. Awarded Navy Silver Star for service while attached to a Marine Air Group during attack on Guadalcanal, September 1943. Home ... Siloam Springs, Arkansas.

Commander William L. STRANGMAN (DC), USN. Awarded Army Silver Star for service during the defense of Corregidor. Taken prisoner, retained at Bilbid Prison Camp until 3-5-1944 when he was transferred to Japan. Released August, 1945 and returned to United States. Home ... Santa Monica, California.

DECORATIONS AND CITATIONS (CONTINUED)

Lt. Commander Laurice A. TATUM (DC), USNR. Killed in action, U. S. S. WASP 9-15-1942. Received Navy Silver Star; DDE named for him. Home ... Birmingham, Alabama.

Captain Francis G. ULLM (DC), USN. Letter of Commendation from the Secretary of the Navy with authority to wear Commendation Ribbon. Home ... [illegible]. Corydon, Indiana.

Lt. Commander Homer C. VAUGHN (DC), USNR. Letter of Commendation by Commander in Chief, Pacific. Home ... Manhasset, Long Island, New York.

Commander Frank T. WAIS (DC), USN. Letter from Commander South Pacific Area and South Pacific Force for service on U.S.S. HORNET at Santa Cruz. Home ... Algona, Iowa.

Commander James L. WAGNER (DC), USN. Bronze Star Medal; Army Unit Citation. Home ... Philadelphia, Pennsylvania.

Commander Carl A. SCHLACK (DC), USN, Ship Commendation from Commanding Officer, U.S.S. WISCONSIN for loyal and efficient performance of duty during the day bombardment of MURORAN, Hokkaido, ~~15~~ ON 15 July, 1945 and night bombardment of Hitachi, Honshu on 17 July 1945.

DECORATIONS AND CITATIONS (CONTINUED)

Lt. Commander Harold F. BIRK (DC), USN, Ship Commendation from Commanding Officer, U.S.S. WISCONSIN FOR Loyal and efficient performence of duty during the day bombardment of Muroran, Hokkaido on 14 July, 1945, and night bombardment of Hitachi, Honshu on 17 July 1945.

Lieut. J. WAIS (DC), USNR, Ship Commendation from Commanding Officer, U.S.S. WISCONSIN, for loyal and efficient performance of duty during the day bombardment of Muroran, Hokkaido on 14 July, 1945 and night bombardment of Hitachi, Honshu on 17 July 1945.

Commander J. R. JUSTICE (DC), USN, Blanket citation of entire Naval Hospital, Pearl Harbor, T. H., for 7 December 1941, Jap attack.

Commander E. DELANEY (DC), USN. Blanket citation of staff of U.S.S. SOLACE for 7 December 1941, Japanese attack.

Commander Sid LIEDMAN (DC), USN. Blanket citation of Staff of U.S.S. SOLACE for 7 December 1941, Japanese attack.

Commander James J. DEMPSEY (DC), USN, letter of commendation by Commander THIRD Fleet, Admiral W. F. Halsey, USN, for services on the U.S.S. LEXINGTON during suicide plane hit on this ship 5 November 1944.

DECORATIONS AND CITATIONS (CONTINUED)

Lt. Commander J. M. ELSON (DC), USNR, letter of commendation by Commander THIRD Fleet, Admiral W. F. Halsey, USN, for services on the U.S.S. LEXINGTON during suicide plane hit on this ship 5 November 1944.

Lieut. Arthur J. Black (DC), USN, letter of commendation by Commander THIRD Fleet, Admiral W. F. Halsey, USN, for services on the U.S.S. LEXINGTON during suicide plane hit on this ship 5 November 1944.

Commander Charles F. HOYT (DC), USN, letter of Commendation from Commander Fleet Air for work in connection with Fleet Air Unit stationed at Quonset Point.

Commander Maurice A. BLISS (DC), USN, commendatory report from Commander South Pacific for performance of duties as Force Dental Officer.

Commander Frank Etter (DC), USN-~~Ret~~, Presidential Unit Citation for Guadalcanal operations.

Lieut. Robert A. OSWALD (DC), USNR, Navy and Marine Corps Medal for activities in Tinian landings 24 July 1944.

Lieut. G. M. LARSON (DC), USN, U.S.S. YORKTOWN (CV-10), Commanding Officer's commendation for meritorious service.

DECORATIONS AND CITATIONS (CONTINUED)

Commander Kenneth L. URBAN (DC), USN, U.S.S. WASP, Commanding Officer's letter of commendation.

Commander W. A. SMITH (DC), USN, U.S.S. BOISE, letter of Commendation from Commanding Officer.

Lt. Commander Spencer A. Rappold (DC), USN, U.S.S. PHOENIX, letter of commendation from Commanding Officer.

Lieut. Albert L. RUSSEL (DC), USN, U.S.S. PHOENIX, letter of commendation from Commanding Officer.

Lt. Commander W. A. ALDRIDGE (DC), USN, U.S.S. PORTLAND, letter of commendation from Commanding Officer for assistance rendered Marine casualties during Okinawa operations.

Commodore G. C. PAFFENBARGER (DC), USNR, letter of commendation from Surgeon General U. S. Navy.

Because of incomplete data available at this writing the list of names here given must be considered incomplete. As more complete and accurate information becomes available it will undoubtedly be published.

ENLISTED PERSONNEL

The number of enlisted personnel listed below who were killed, wounded, received citations and decorations, represent pharmacist's mates of the whole Hospital Corps. No data was available at this writing to show what number of these, receiving such honors, were dental technicians, although approximately 7.59% of the Hospital Corps during the war were dental technicians (11). Subsequent publications however should make such data available as the records are separated and analyzed.

Commendations, unit citation and commendatory mention	1183
Wounded	861
Killed in action	795
Medical discharge due to combat or overseas service	736
Wounded in action	328
Meritorious advancement in rating	156
Silver Star Medal	94
Died while Prisoner of War	90
Bronze Star Medal	62
Navy and Marine Corps Medal	35
Army Group Commendation Badge	26
Navy Cross Medal	25
Medal of Honor	4
Legion of Merit	3
Army Silver Star	1

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A-C-K-N-O-W-L-E-D-G-M-E-N-T-S

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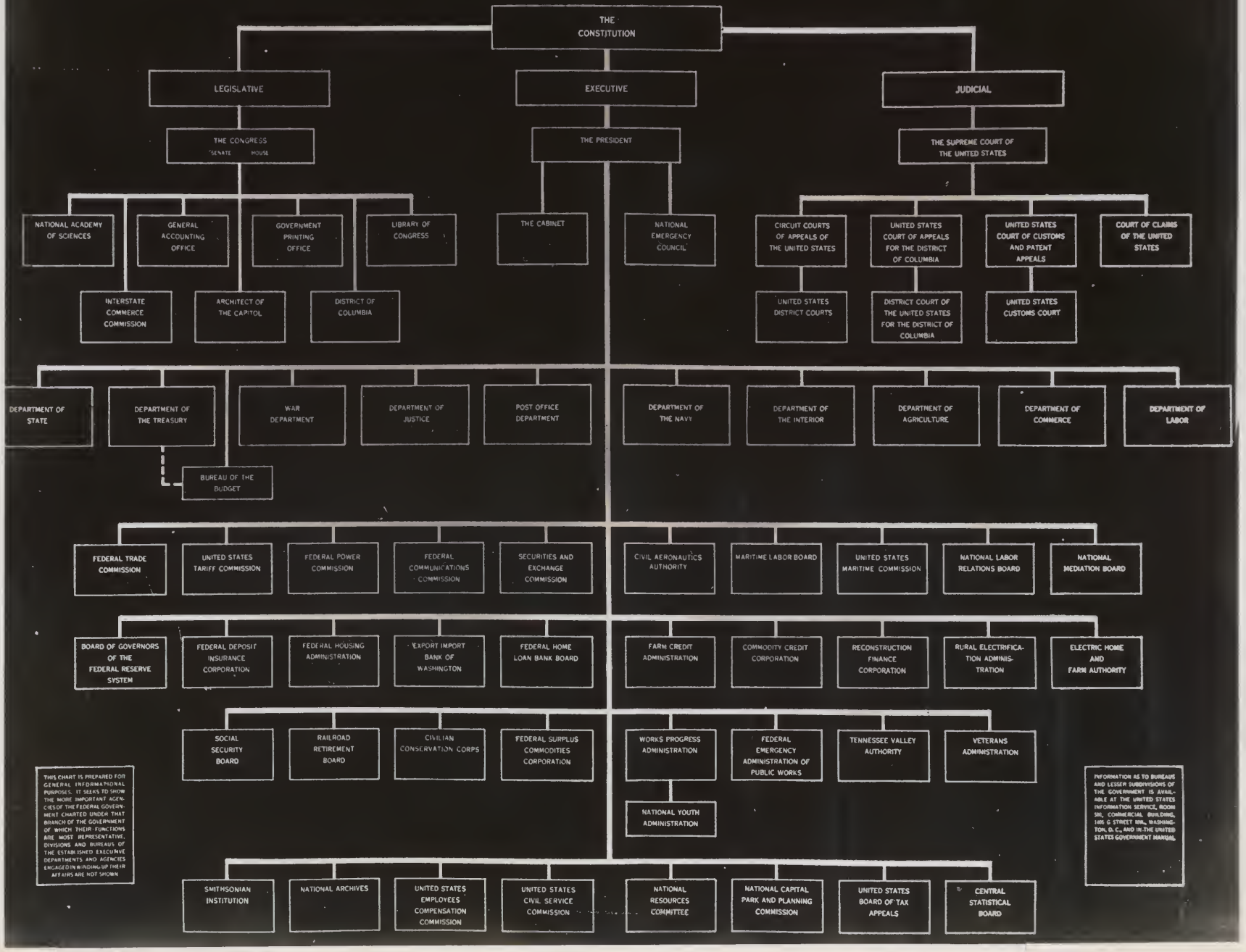
THE UNITED STATES OF AMERICA

THE FEDERAL GOVERNMENT



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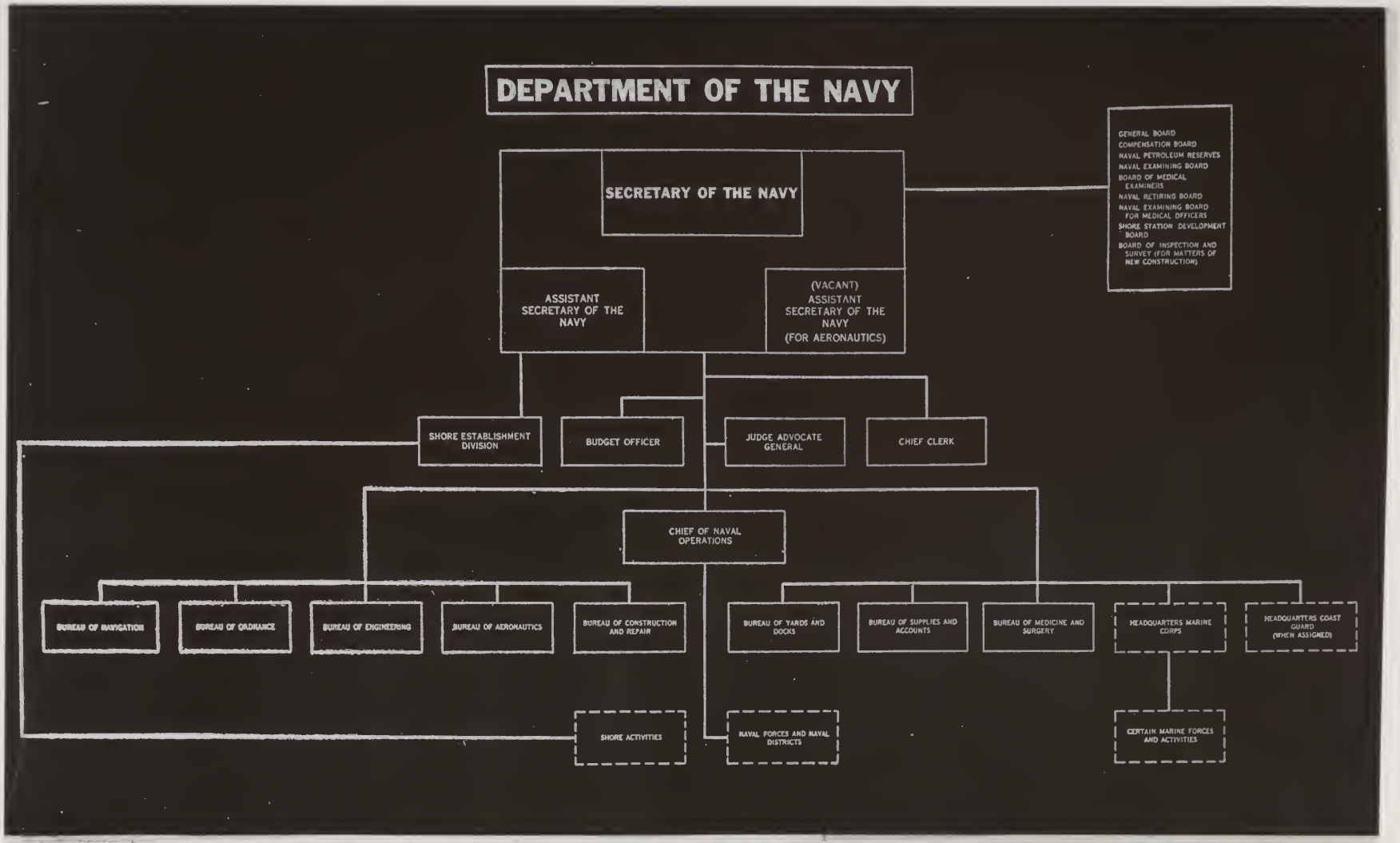


Fig. 2

Organization of the Navy prior to World War II

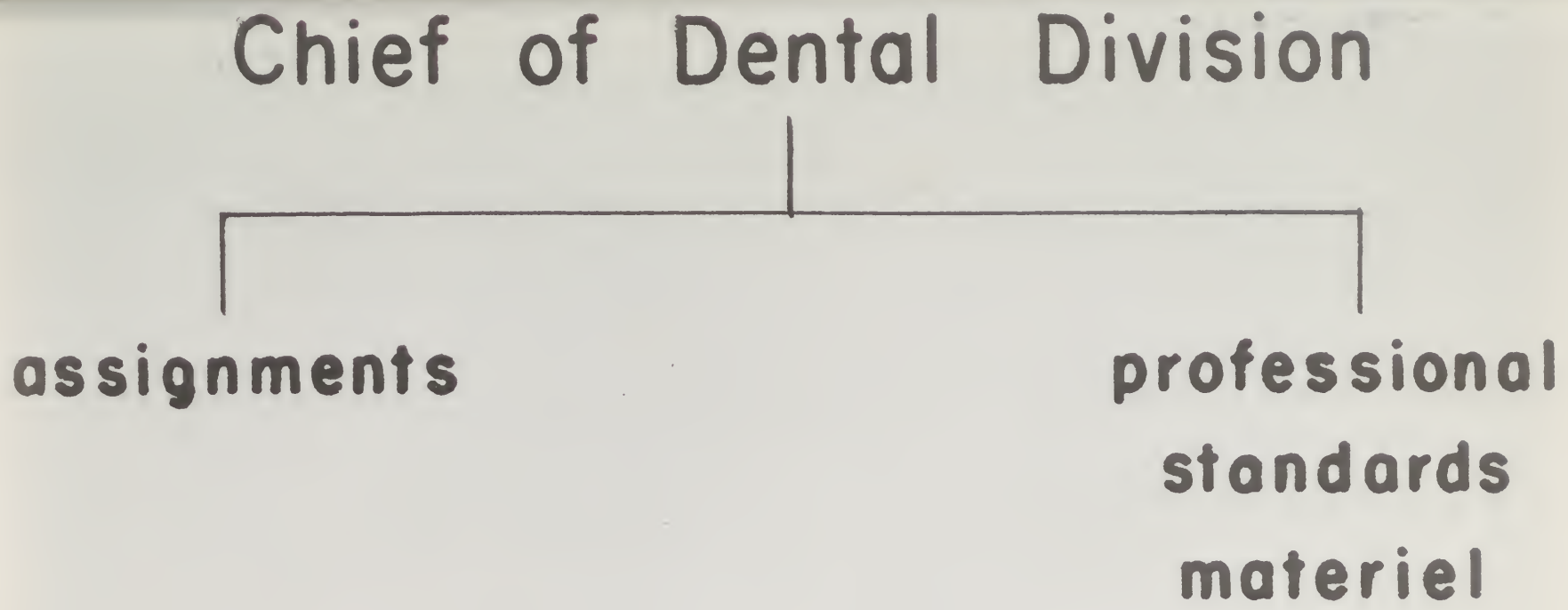
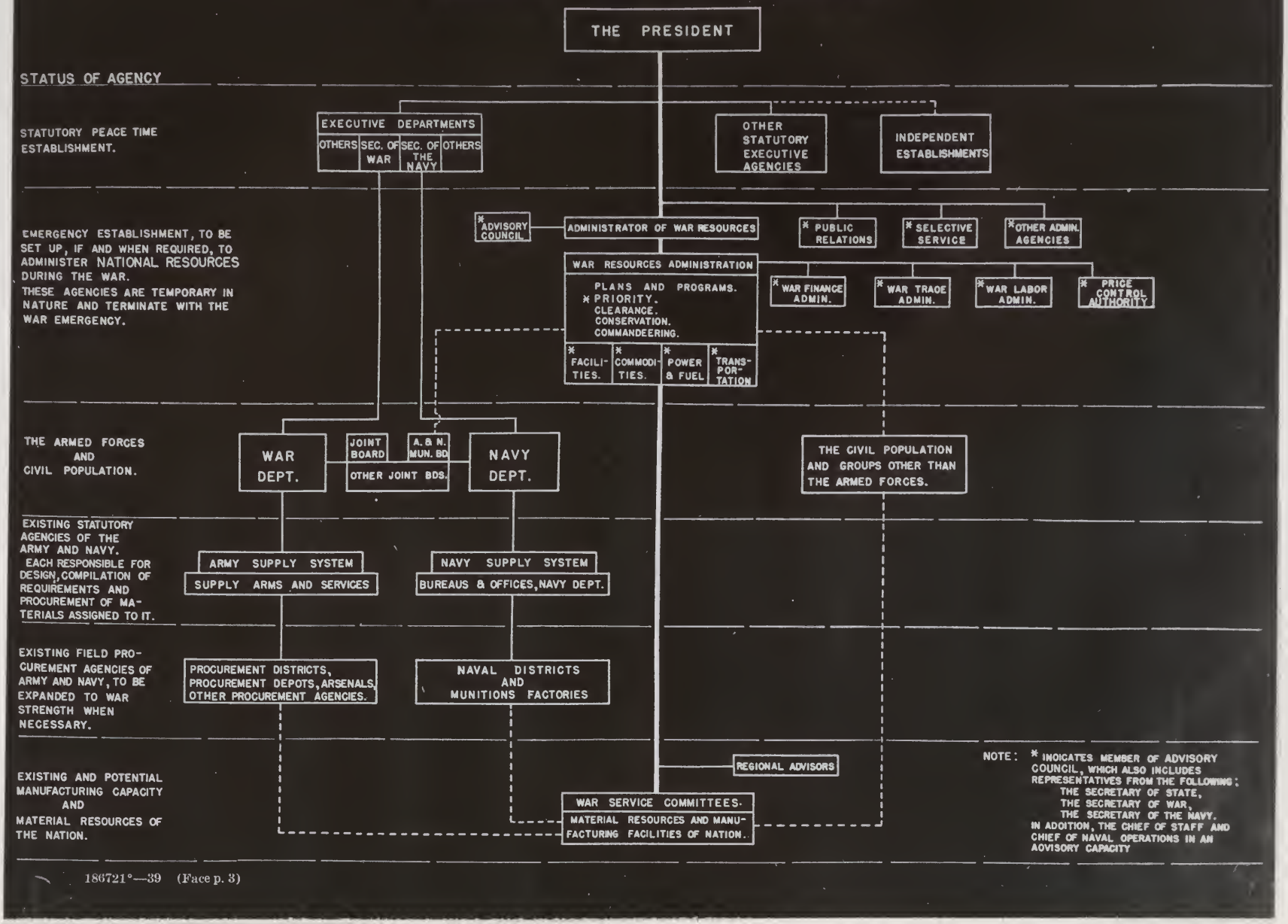


Fig.3

Organization of the Naval Dental Division prior to World War II....

SUGGESTED ORGANIZATION FOR COORDINATION OF NATIONAL RESOURCES
AND
MOBILIZATION OF INDUSTRY IN TIME OF MAJOR WAR.



186721°—39 (Face p. 3)

Fig. 4

No.1262b

OUTLINE CHART OF THE WORLD

Small corrections from Notices to Mariners and other sources

DISTRIBUTION OF NAVAL DENTAL FACILITIES DURING WORLD WAR II
● = NAVAL DENTAL TREATMENT AVAILABLE • These facilities were not continuous throughout the war but were relocated as military advances were made.

Washington D.C. published Jan. 1943 at the Hydrographic Office under the authority of the SECRETARY OF THE NAVY

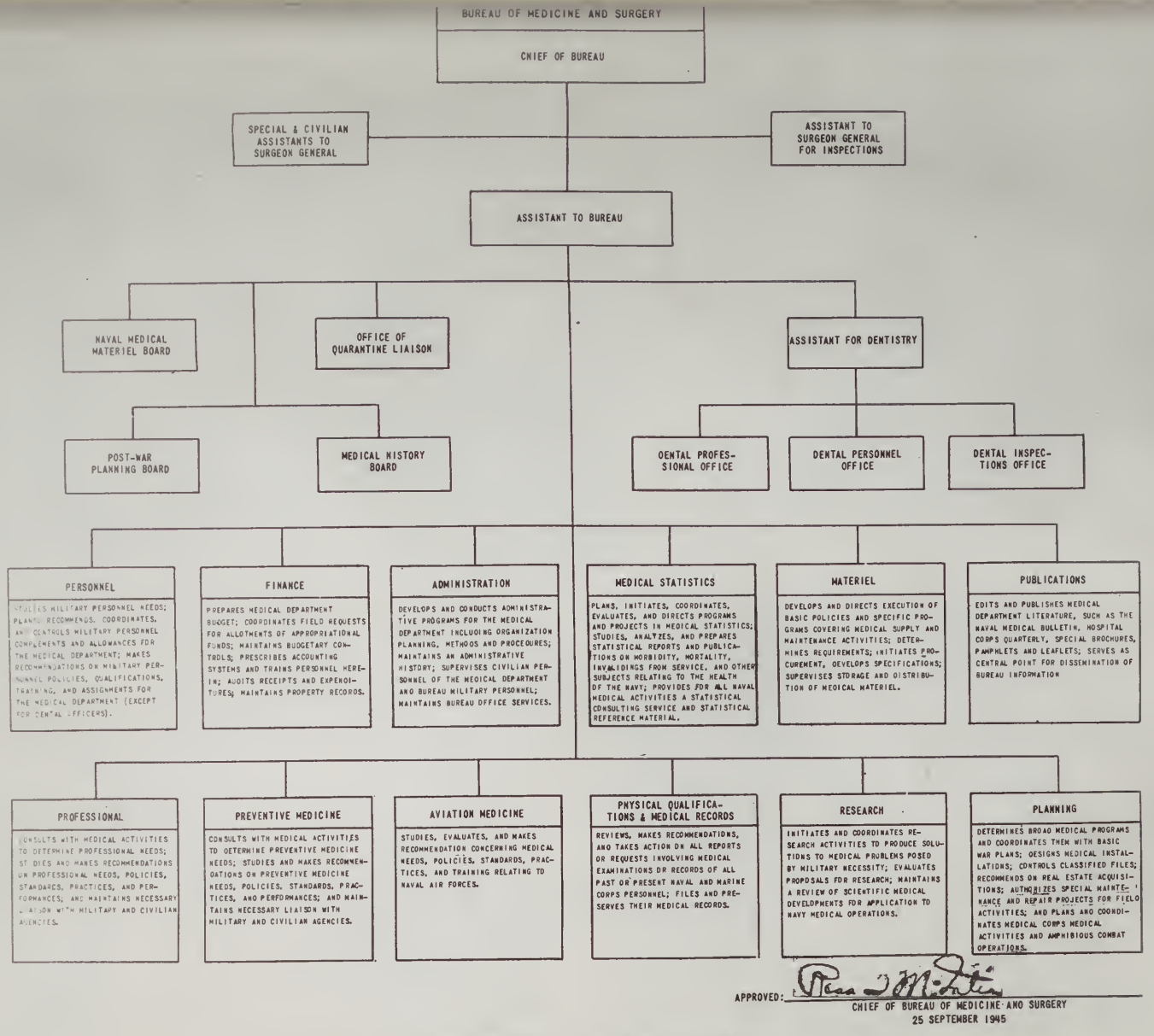
NAVAL DISTRICTS OUTLINED AND INDICATED BY NUMBER

New Publication 3dEd Jan 1937

4th EDITION, July 1941

No.1262b

Fig.5



ORGANIZATION OF BUREAU OF MEDICINE AND SURGERY

A-44201

Fig.7 Organization Bureau of Medicine & Surgery

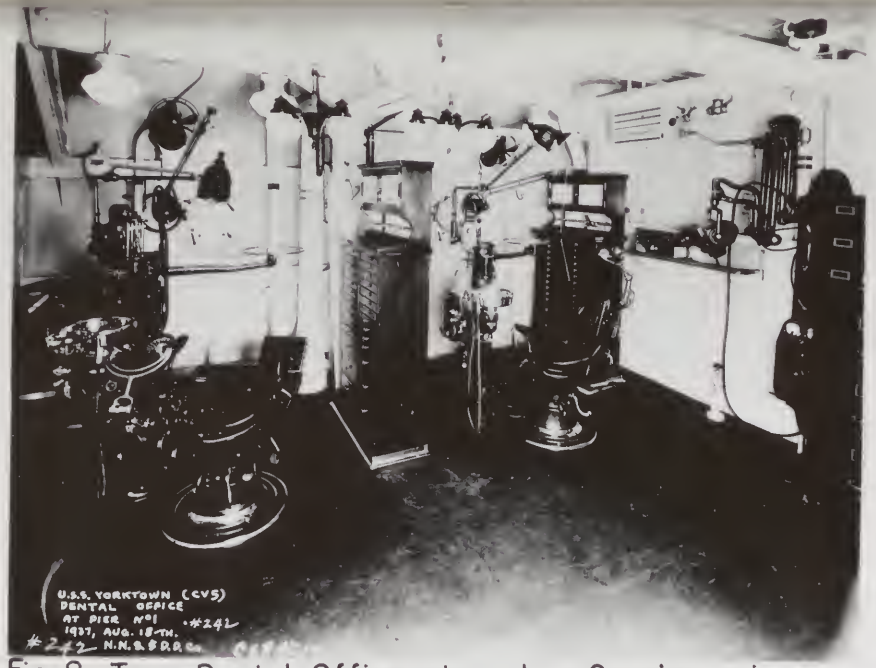


Fig.8 Type Dental Office aboard a Carrier prior to World War II

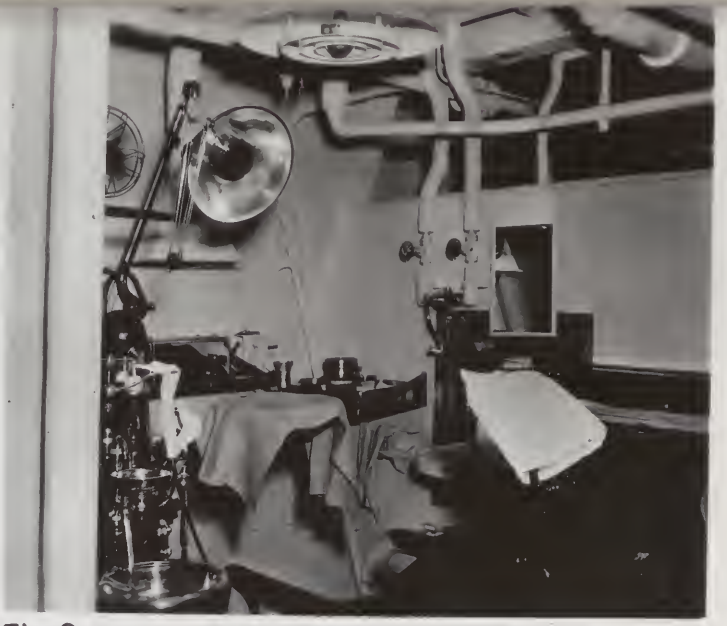


Fig.9 Type Dental Office aboard a Battleship at close of World War II

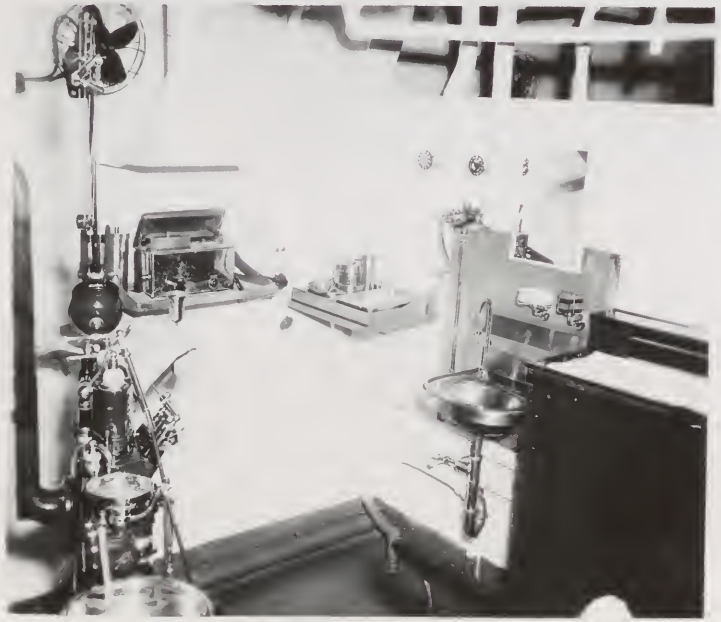


Fig.10 Another view of Fig.9 (Note sterilizing equipment with exhaust)

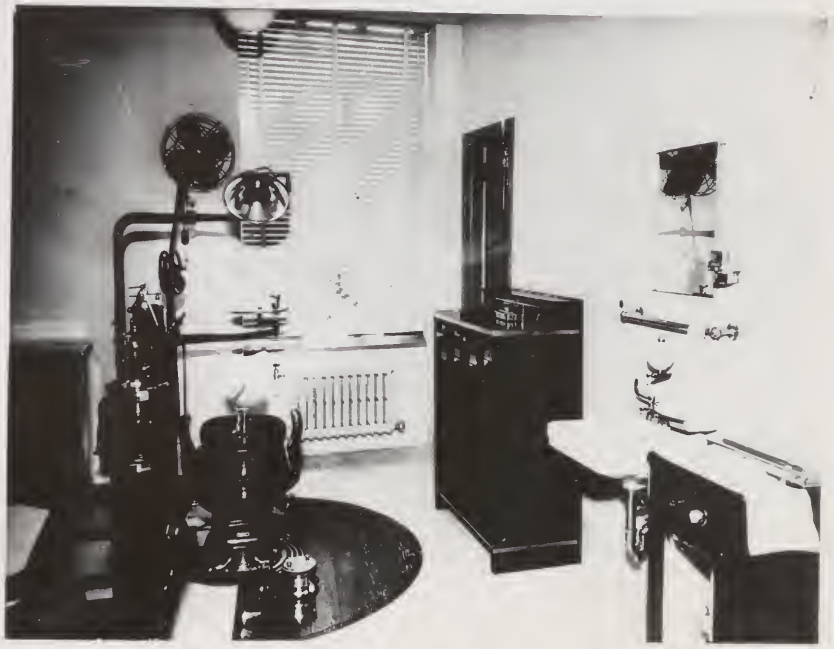
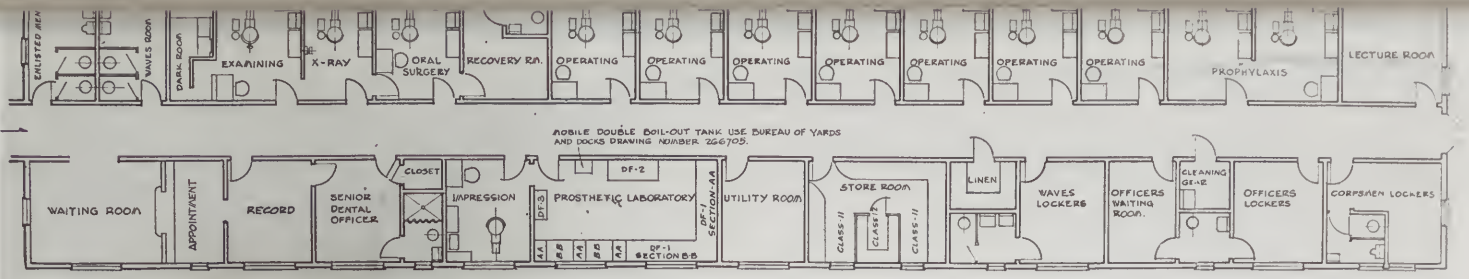


Fig.11 Type Naval Dental Office ashore at the close of World War II



TYPICAL DENTAL LAY-OUT
FOR
NAVAL SHORE ESTABLISHMENTS

0' 5' 10' 15' 30'
GRAPHIC SCALE

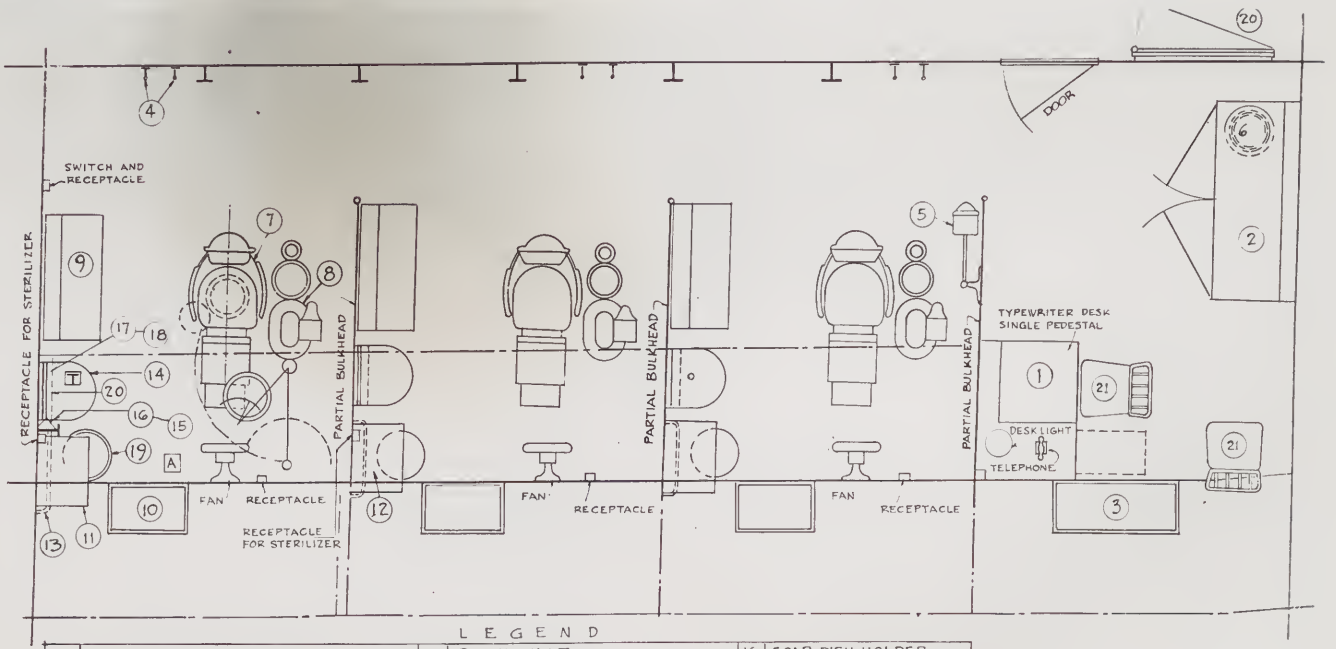
NOTE-
AIR COMPRESSOR TO BE PLACED IN EXCAVATION OF THIS BUILDING IF PRACTICABLE - OTHERWISE TO BE PLACED IN UTILITY ROOM.

DARK ROOM-ARRANGEMENT.
USE YARD AND DOCKS STANDARD PLAN DRAWING NO. 194415 A.

PROSTHETIC DENTAL LABORATORY.
ARRANGEMENT OF FURNITURE, BENCHES AND EQUIPMENT, - USE YARDS AND DOCKS STANDARD PLAN DRWG. NO. 194415 AND NO. 266705

DENTAL OPERATING ROOM DESKS.
USE BUREAU OF YARDS AND DOCKS STANDARD PLAN DRAWING NO. 1944-15A.

Figure 12 (143)



LEGEND

1	TYPEWRITER DESK - SINGLE PEDESTAL.	8.	DENTAL UNIT.	16.	SOAP DISH HOLDER.
2	DENTAL UTILITY CABINET	9.	DENTAL CABINET	17.	TUMBLER.
3	BOOK RACK.	10.	WORK SHELF	18.	TUMBLER HOLDER
4	COAT AND HAT HOOK.	11.	SHELF FOR STERILIZER	19.	WASTE RECEPTACLE.
5	X-RAY UNIT - DENTAL	12	DENTAL INSTRUMENT STERILIZER	20.	BULLETIN BOARD.
6	AIR COMPRESSOR INSTALLED IN DENTAL UTILITY CABINET.	13.	TOWEL ROD	21	OFFICE CHAIR
7.	DENTAL CHAIR.	14.	LAVATORY		
		15.	SOAP DISH.		

TYPICAL SHIPBOARD DENTAL FACILITY

Figure 13 (143)

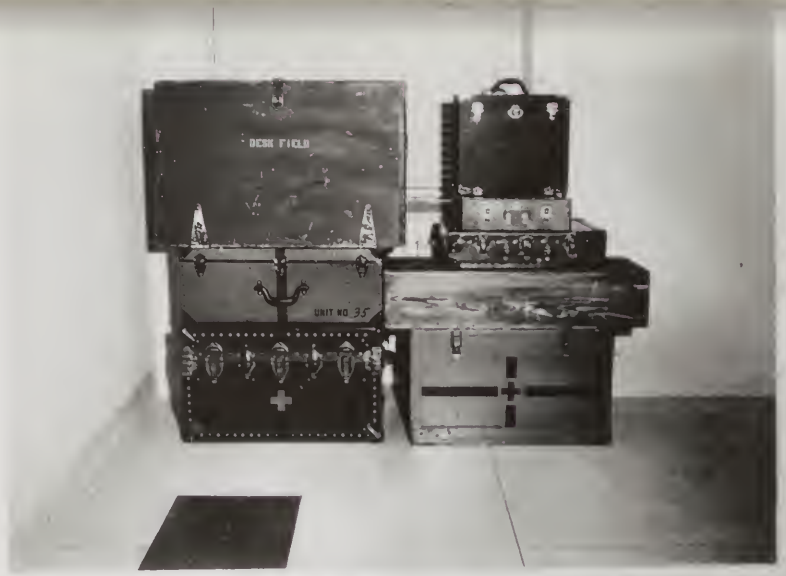


Fig.14 Type Naval Dental Portable equipment used in World War II, particularly with Marines in forward areas.

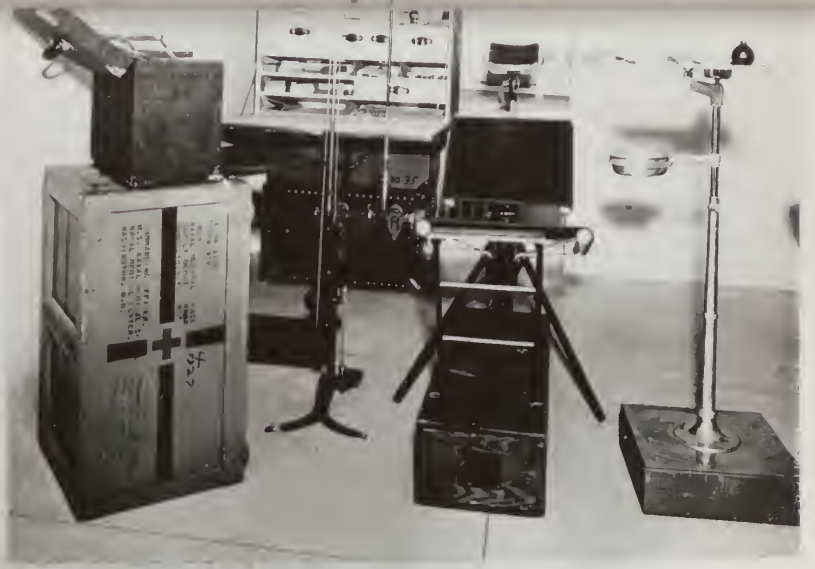


Fig.15 Same as Fig.14 but opened ready for use.

Fig.16 Mobile type Naval Dental Clinic (operative) developed & used in World War II (13)

Fig.17 Same as Fig.16 Interior view (13)

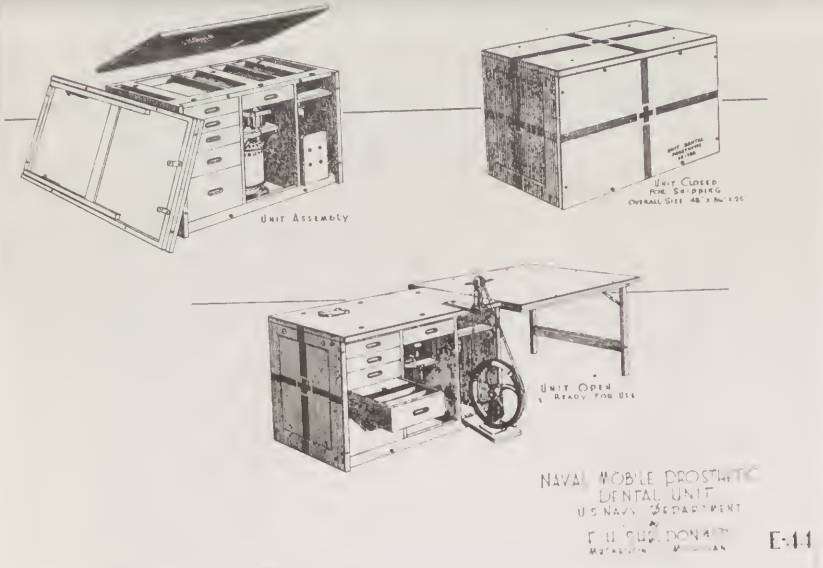


Fig.18 - MOBILE PROSTHETIC UNIT (143)

Fig.19 Type Dental Prosthetic Clinic developed by Naval Dental Officer with C.B. Battalion (165)

Fig.20 Same as Fig.19 Another view. Note large rings on top side to be engaged by crane and lifted aboard

Fig. 21. Interior View of a C.B. Prosthetic Activity (165).

Fig. 22 Same as Fig. 21 (165)

Fig. 23 Same as Fig. 21 (165)

Fig. 24. Same as Fig. 21 (165)

Fig. 24A Prosthetic Trailer (Marine) (13)

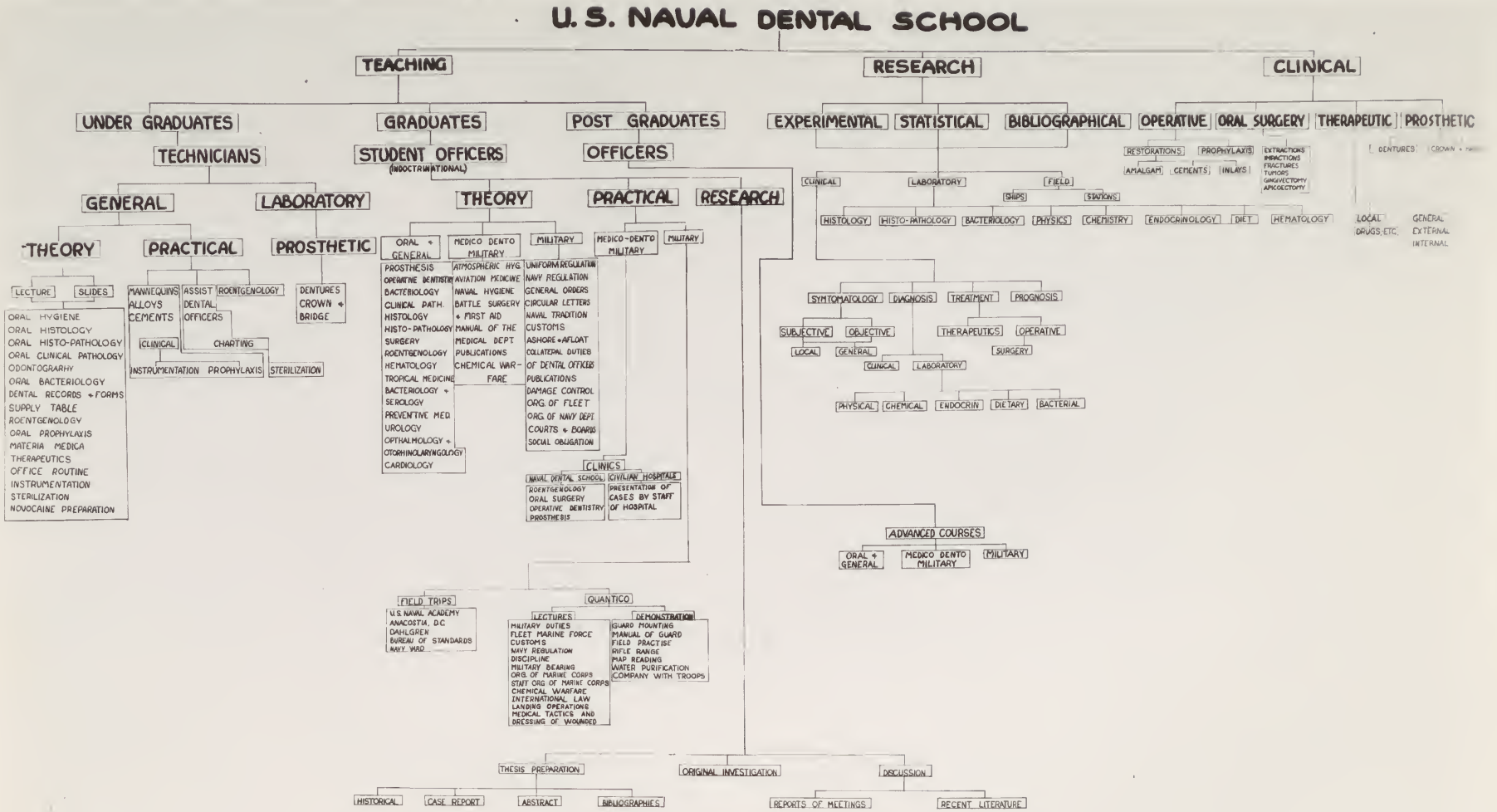
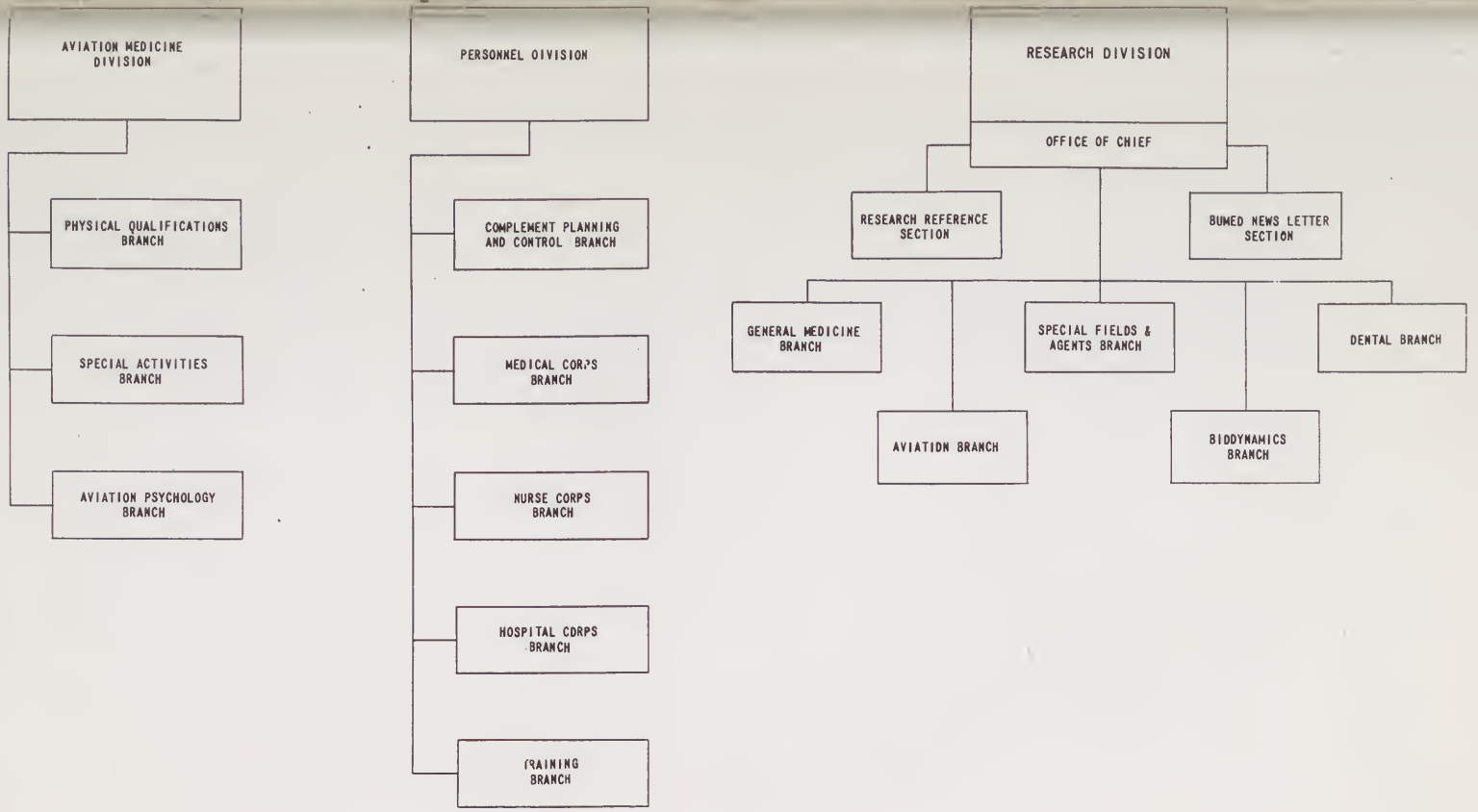


Fig.25 Organization of Naval Dental School at commencement of hostilities in World War II



ORGANIZATION OF AVIATION MEDICINE, PERSONNEL, AND RESEARCH DIVISIONS
BUREAU OF MEDICINE AND SURGERY

Fig. 26

NAVAL MEDICAL RESEARCH INSTITUTE
ORGANIZATION CHART

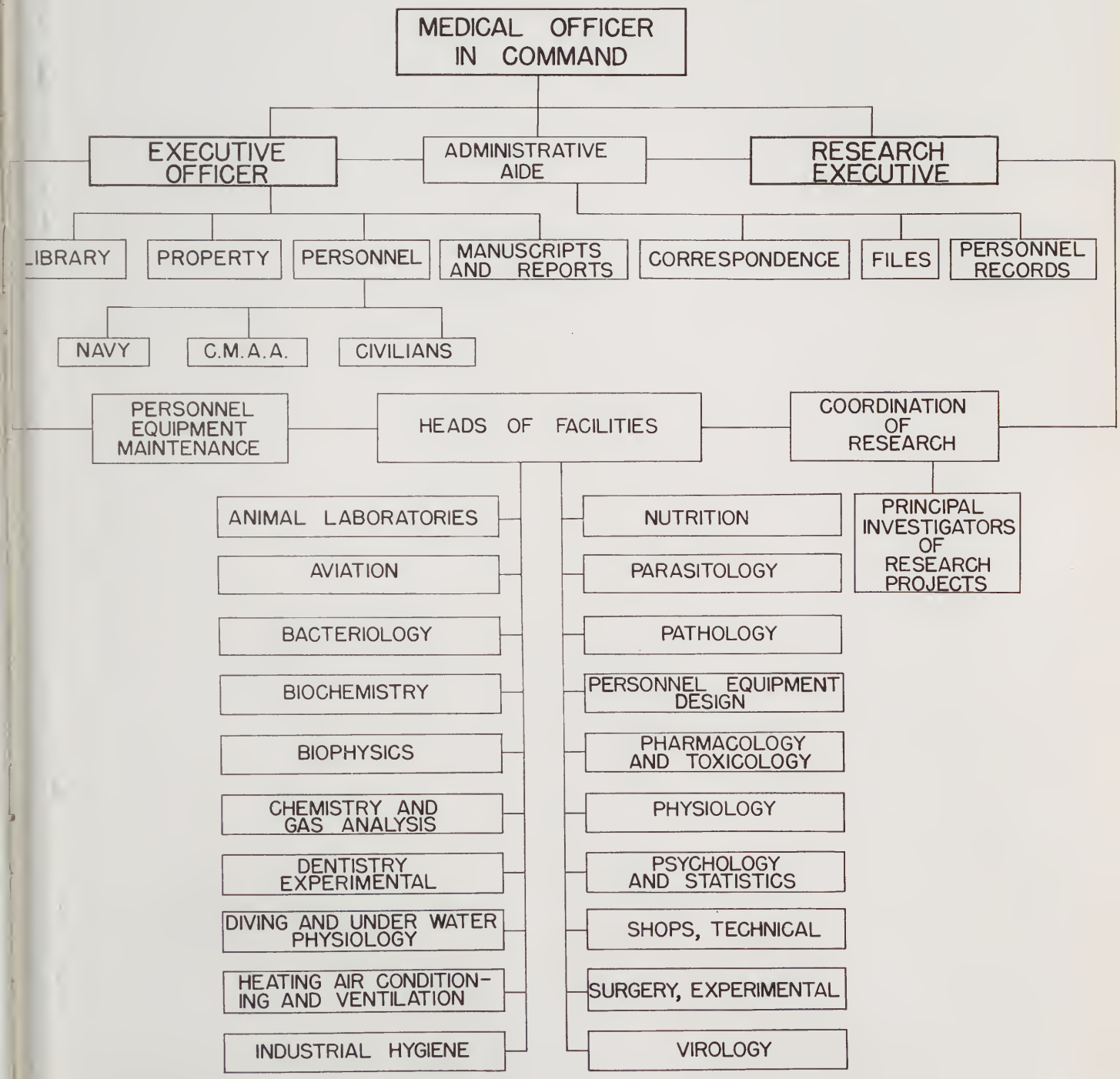
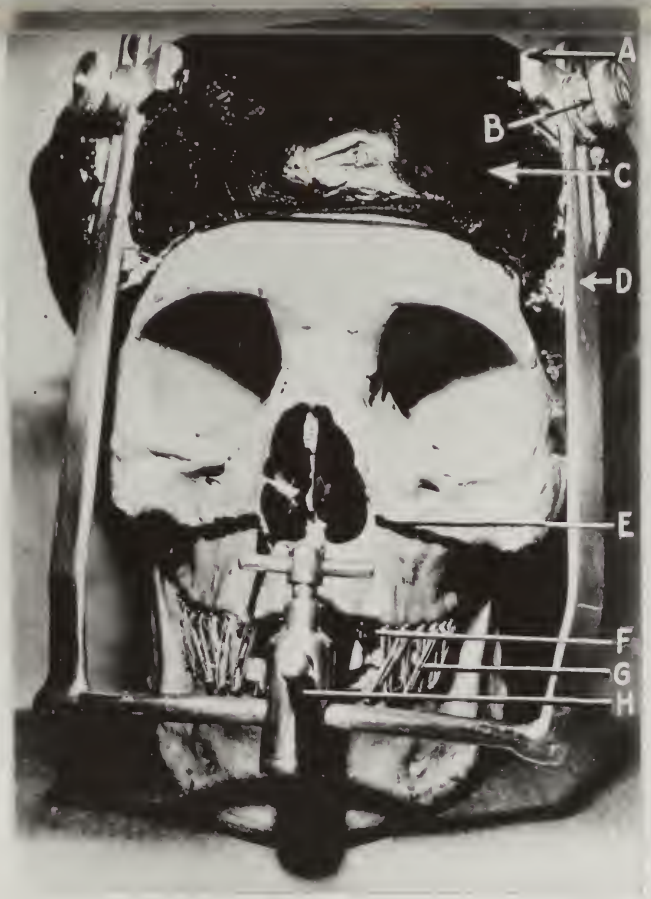


Fig. 27



xtra-oral appliance constructed of duralumin

- Horizontal bar.
- Lock nut.
- Plaster head cap.
- Vertical bar.
- Fracture lines.
- Minter arch splint.
- Rubber ligatures.
- Attachment

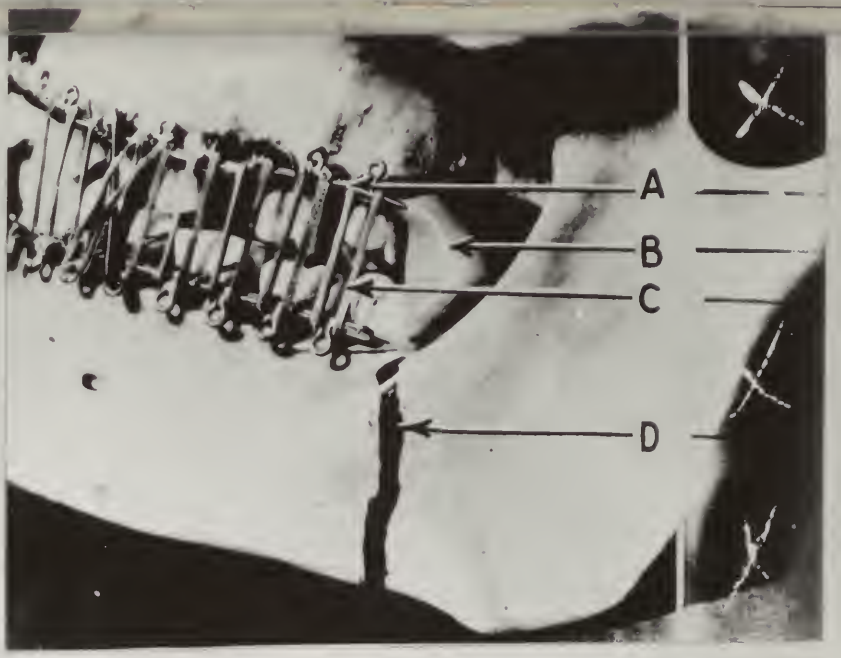


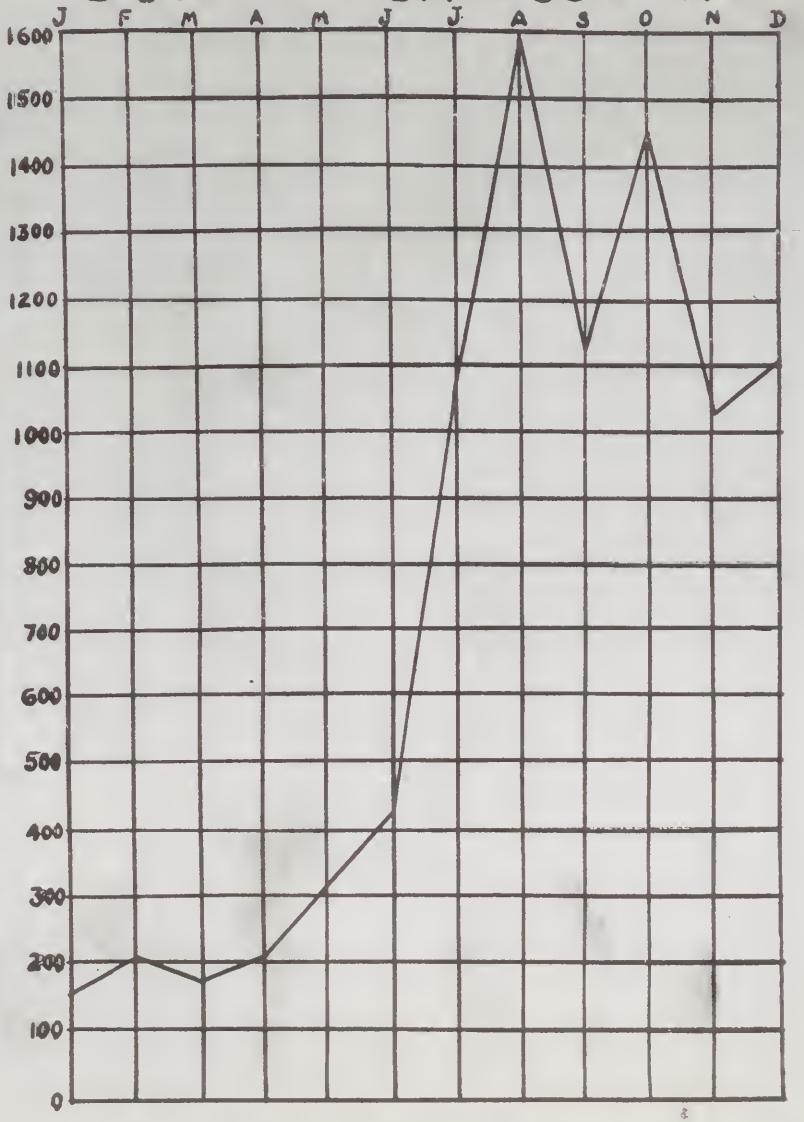
Illustration of appliance on model

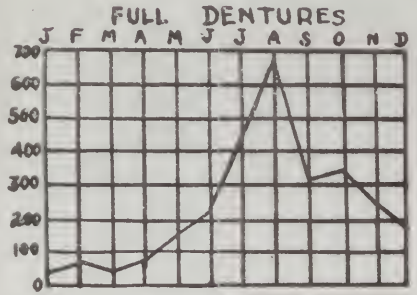
A-Jelenko arch splint.
B-Vulcanite saddle.
C-Rubber ligatures.
D-Fracture line.

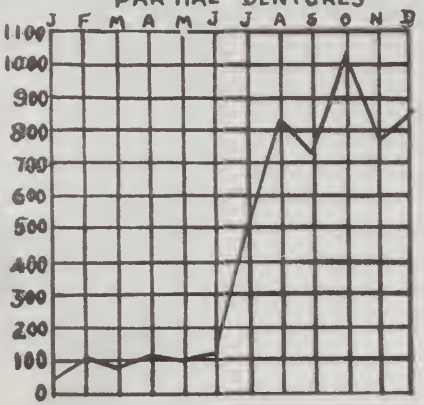
Fig. 28 One type of fracture appliance used in Navy.
(143) Other types included circumference wiring, rigid intermaxillary wiring & cast splints. Extra oral pin fixation found to be very limited in application. (165)

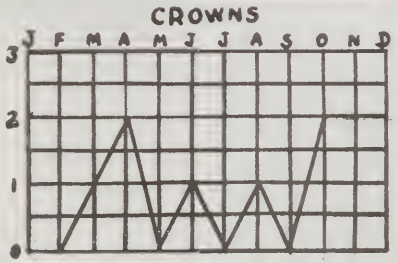
DENTAL PROSTHETIC ACTIVITY 1944

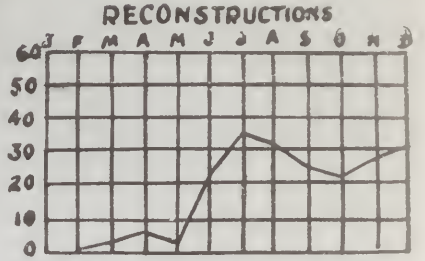
USNTC SAMPSON NY

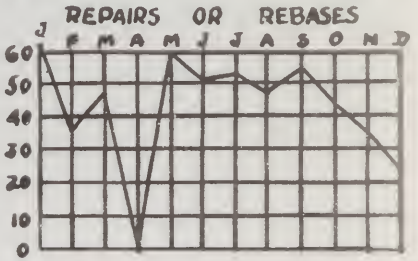


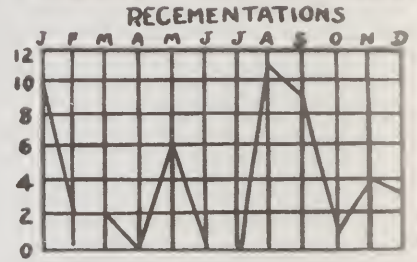


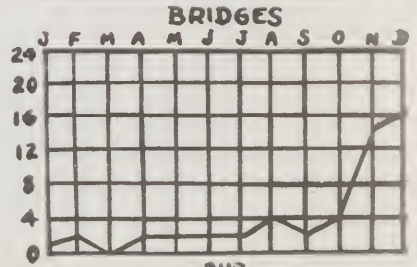












SH3

DENTAL OFFICERS	5	5	5	5	5	20	20	20	20	20	20	20
TECHNICIANS - DPT. (DP)	10	10	12	14	13	78	81	90	96	95	89	92
TECHNICIANS DGT					2	22	18	18	18	21	21	21
STUDENTS - DTP										8	6	10

Fig. 30. Personnel attached to this activity was 66 prosthodontists and 110 laboratory technicians. (165)

Fig. 31. Same as above (fig. 30) -- Interior view. (165).

Fig. 32. Type dental clinic built during World War 2. (165)

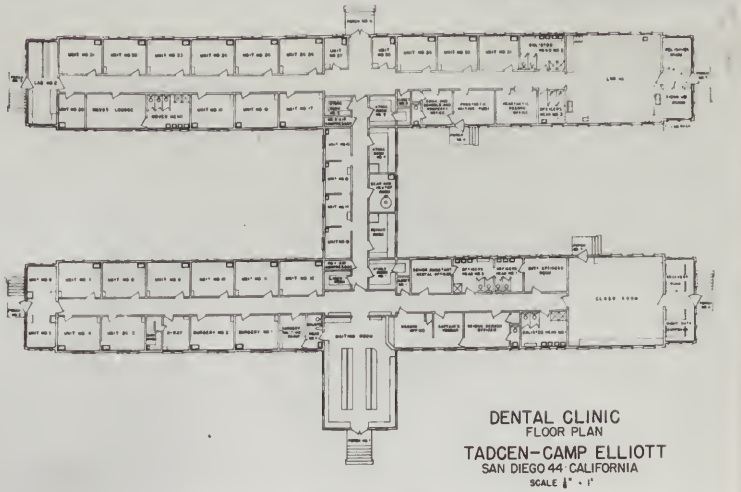


Fig. 33. Plan of clinic shown in fig. 32.

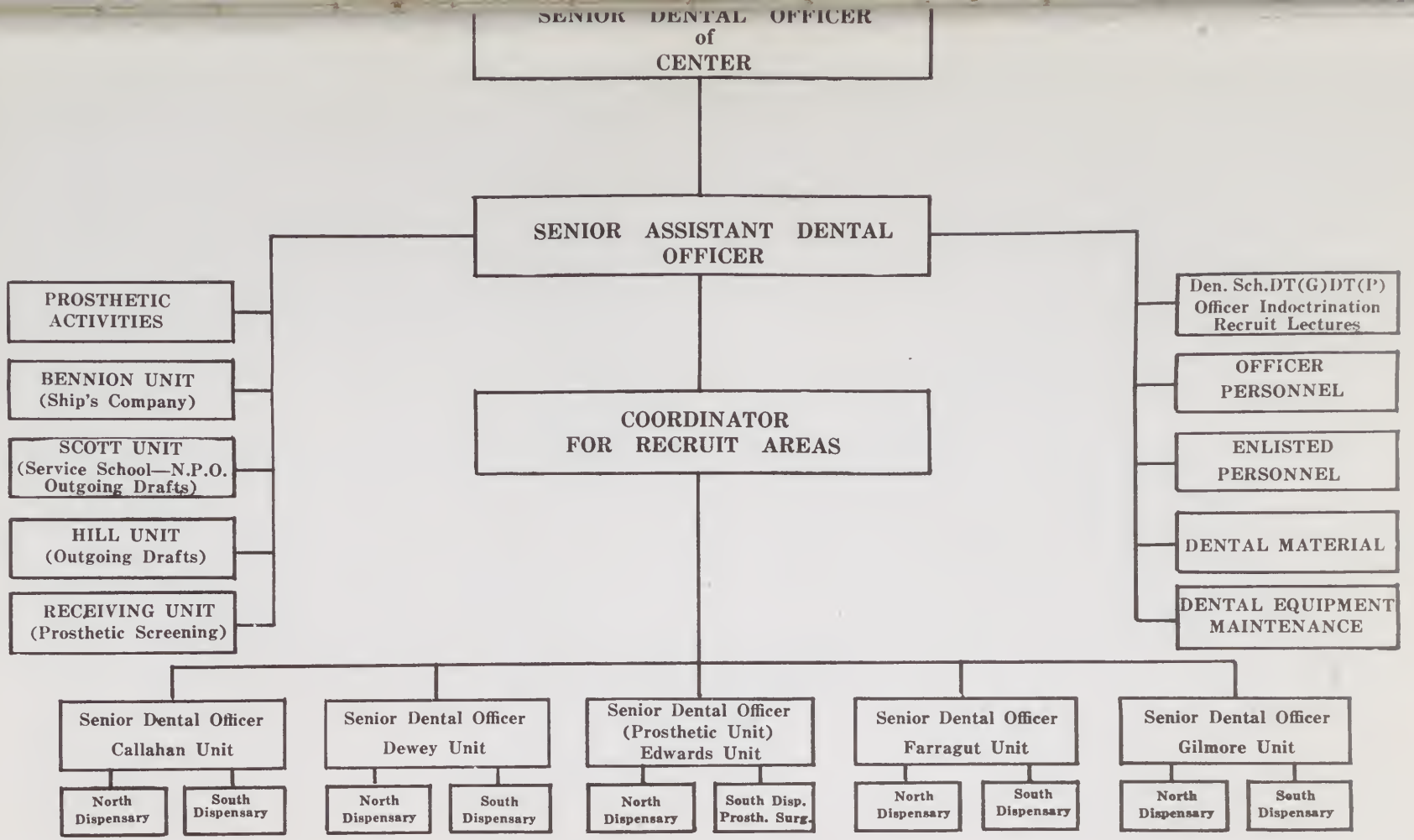
Fig. 34. Dental ward at a large Naval Training Center.

Fig. 24B Interior of 24A (13)

Fig. 36 Interior of Fig. 35 (165)

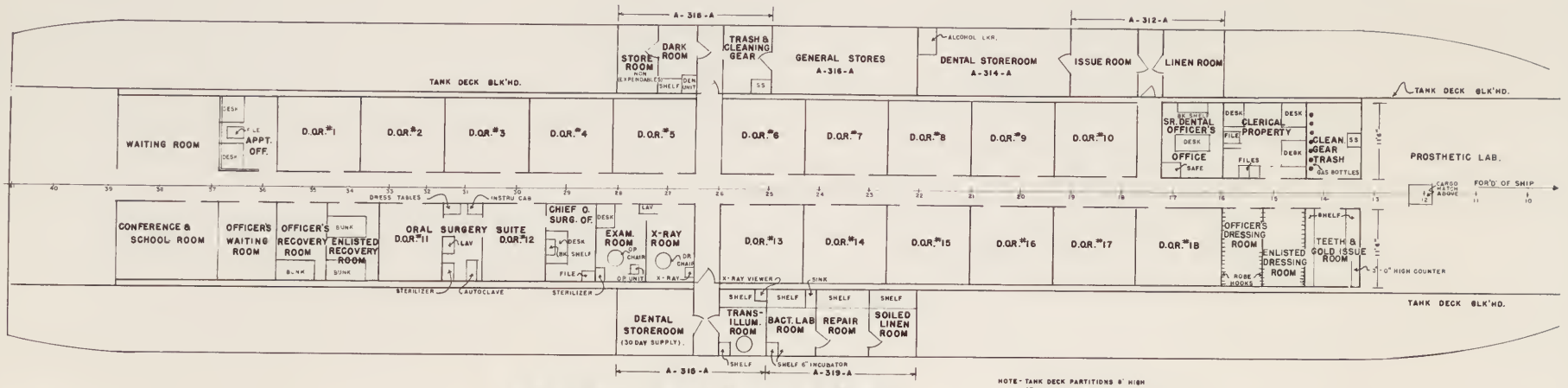
Fig. 35 Quonset hut used as a dental dispensary in forward areas. (Saipan)(165)

Fig. 37 Tent dispensary used with Marines. Equipment shown in Fig. 14 & 15 (165



ORGANIZATION
of the
DENTAL ACTIVITIES
USNTC, SAMPSON, N.Y.

Fig.38 An example of the organization at one of the larger activities.



SUGGESTED ARRGT'S FOR DENTAL SPACES AT 3RD DECK

SCALE: 1/8" = 1'-0"

NOTE- TANK DECK PARTITIONS 8' HIGH OTHER PARTITIONS TO OVERHEAD

Fig.39 Plan of proposed Dental Clinic Ships

Carl A. Schlack
Comdr. DC USN

MS.
B
192